

RAY, J.

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PHILOSOPHICAL
LETTERS

Between the late

Learned Mr. *R A Y*

And several of his Ingenious

CORRESPONDENTS,
NATIVES and FOREIGNERS.

To which are added those of

Francis Willughby Esq;

The Whole consisting of many curious Discoveries and Improvements in the History of Quadrupeds, Birds, Fishes, Insects, Plants, Fossiles, Fountains, &c.

Published by *W. DERHAM*, Chaplain to his Royal Highness *George Prince of Wales*, and *F. R. S.*

L O N D O N :

Printed by WILLIAM and JOHN INNYS, Printers to the *Royal Society*, at the *Prince's Arms* in *St. Paul's Church-yard*. 1718.



To the HONOURABLE
SAMUEL MOLYNEUX *Esq;*
S E C R E T A R Y
TO
His Royal Highness
THE
Prince of *W A L E S*,
and *F. R. S.*

THIS
COLLECTION
OF
Philosophical Letters

Is humbly DEDICATED

By His

Most Obliged,

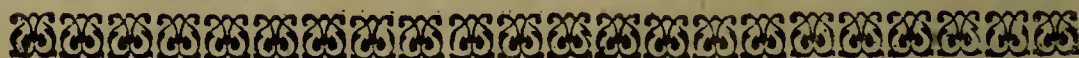
Humble Servant,

W. DERHAM.



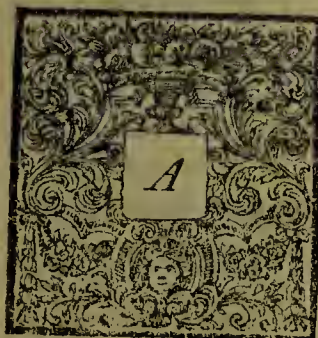
By reason of the Obscurity of the Hand-writing, or the Decay thereof, together with the Distance of the Publisher, these Faults have escaped the Press.

PAGE 48. l. 14. *A little i should end MARCi thus.* l. 15. read *ANO 7 LEG.* p. 52. l. 13. *dele the.* p. 56. l. 1. r. *and are not.* l. 3. r. *that make use of.* p. 74. l. 6. r. *Lilax.* l. 12. *for leave r. give.* p. 83. l. ult. r. *Borage.* p. 90. l. 1. r. *bear.* p. 98. l. 19. r. *defer.* p. 108. l. 2. r. *Greta-Bridge.* p. 111. l. 5. r. *Boyles.* p. 117 and 119. *Mr. Dent's two Letters are misplaced.* p. 138. l. 2. r. *Hoier.* p. 148. l. 6. *after ecoffe add &c.* p. 180. l. 19. r. *Rotele.* p. 184. l. 7. r. *whereinto.* l. 24. r. *or Figures.* p. 186. l. antepenult. r. *Steams.* p. 199. *In the Figure of the Branlin, the uppermost of the two Spots in the Neck should be larger than the lowermost, and a Row of 8 large Spots should be on the Line parting the Back and Belly.* p. 200. l. 1. r. *Ampelis.* l. 20. r. *Iyngis.* l. 25. r. *Rectrices.* p. 243. l. 31. r. *tumid.* p. 262. l. 20. d. *Answer.* l. 22. d. *an.* p. 276. l. 1. r. *Leewenhoecks.* l. 8. r. *The foregoing Hypothesis.* p. 283. l. 7. r. *Gur.* p. 291. *after l. 27. insert Fr. Vaughan.* p. 292. l. 12. r. *Collegue.* *After l. 25. insert Nath. Wood.* p. 300. l. 33. r. *ad Mœnum.* p. 319. *after l. 3. insert W. D.* p. 358. l. 1. r. *Mars.* l. 14. *for Willisel, r. Willughby.* p. 367. l. 28. r. *Lagopus.* p. 369. l. 8. r. *Bobertus.*





TO THE
READER.



After the Death of the late justly famed Mr. Ray, his Papers were entrusted with me, that if I thought any of them might be of use to the learned World, I might publish them. When I undertook the Labour of perusing and putting them in order, I confess I thought there might have been some Tracts designed and fitted up for the Publick by an Author so considerable as Mr. Ray was, who had published so many good things as he had done: But all that I met with was his Observations of Insects, (which he lived not to perfect, and which are already printed) and the Diaries of his Travels about Great Britain and in Foreign Parts, and his Letters to and from learned Men. His Foreign Travels he published himself; but for Brevity, I find he hath omitted many very good Observations that well deserve to see the Light. And as for his Travels about England, Scotland, and Wales, I have fitted them up for the Press, with an Intent to have published

The P R E F A C E.

published them with his Life, which I began to write at the Instance of my late much Honoured and right Reverend Diocesan Henry Lord Bishop of London, and some other very considerable Friends, whose Importunities I could not with Civility withstand. But notwithstanding the Itineraries are in a great Forwardness, and I have made a considerable Progress in his Life, yet I fear I shall scarce be able to accomplish what I intended, having much less Leisure now than when I undertook that Work.

As to his Letters, he had treasured up many, or most of those which he had received from his learned Correspondents; which occasioned me a great deal of trouble in perusing them, and selecting such as might be of use to the Curious: And after I had selected them, I thought it necessary to leave out all that might be of little use, such as private Business, Complements, &c. except now and then a Clause, that may be of use to Mr. Ray's, or some other learned Man's Character, or that may shew their learned Projects, or give some Account of their Labours.

So that the Reader hath in this Collection the Marrow and most valuable Part of Mr. Ray's Correspondences with his learned and ingenious Friends. And altho' there may probably be now and then a few Passages of lesser Consideration that might have been omitted, and a Letter or two that might have been shorten'd, (as it was my mind to have done, had I had Health and Time) yet I hope the Reader will find so entertaining and profitable a Variety of curious Learning, as will sufficiently compensate for Defects, and cause him to think, that neither I have cast away my Time and Pains, nor be his Cost.

Besides these, there were Letters of other learned Men at Home and Abroad, particularly divers from Dr. Hotton, the learned Botanick Professor of Leyden. But the Doctor's Relations (soon after his Death, which was not long after Mr. Ray's) strictly forbade the
Publi-

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Publication of any of them. And as for the Letters of other great Men to Mr. Ray, which I have not published, they being Matters of Thanks and Complement chiefly, would have been of no other use, than to have shewn what eminent Men Mr. Ray corresponded with, and how well they approved of his excellent Labours: Which being things sufficiently known, or that may be presumed, I thought it needless to stuff the Volume, and enhance its Price by so frivolous a Means.

And as I have thus taken care to reject Papers of little or no Consequence, and to omit in others Matters of small Consequence, so the learned Authors may think I have been too bold with them. But, in answer hereto, I say that I have endeavoured to do, as near as I could, what I thought they would have done themselves. I have omitted, for the most part, (or inadvertently published) what Mr. Ray or others had published before, unless in some Cases, as when it is joined with some other considerable Matter unpublished, or serves to explain, illustrate, or render what is published more compleat. And I have published what I thought might be instructive or entertaining to the Curious, so far as to make a commodious Volume. And as for such valuable Papers as are omitted, they may make another Volume, if this be kindly received.

As to the Chasms that may be observed between the Dates of some of the Letters, and the want of Answers to some, it was not from any Carelessness or Omission in me, but from a Defect among the Letters themselves, which I conceive were either not preserved, or else the Correspondence might be intermitted.

As for the Method, I was in doubt whether it was best to put every Man's Letters by themselves, or according to the Order of their Dates. But the latter being best approved of by some of the Authors themselves, and that which indeed I had good Reasons to esteem best, I accordingly did it as well as I could, abating for a Mistake or two, where the Papers happen'd to be mislaid.

Having

The P R E F A C E.

Having given an Account of what I have done as Publisher, it is time to recognize the Assistance I had from my Friends. Sir Hans Sloane, and Dr. Tankred Robinson, (two of the principal and most learned Friends of Mr. Ray) very readily furnished me with what Papers they had of Mr. Ray's: And the latter procured also for me those which Dr. Lister had carefully laid up as Cimetia. Mr. Dale of Braintree, (Mr. Ray's Neighbour and industrious Friend) who had taken care to preserve many of Mr. Ray's Papers after his Death, very readily imparted them, and gave me his Assistance: As also the Reverend and worthy Mr. Pyke, Rector of Mr. Ray's Parish, gave me what Assistance he could: But none more ready than Mrs. Ray herself, and her Daughters, who not only entrusted me to search Mr. Ray's Papers, but to carry away what I pleased.

And as for the Papers in the Appendix, they are owing to the Favour of the surviving Remains of Mr. Ray's best Friend and Patron the great Mr. Wilmughby; namely, the Right Honourable the Lord Middleton, and his noble Sister the Countess of Carnarvon, who knowing of my Design, with all Readiness procured for, and sent me Mr. Ray's, and some other learned Men's Letters, to their most ingenious Father; which coming too late to be ranked in their Order in the Body of the Book, I was forced to cast into an Appendix.



Mr.



Mr. RAY's
LETTERS
And other
PAPERS.

*Dr. BARROW to the Fellows of
Trin. Col. Cambridge.*

From Constantinople, August 1658.

Reverendissimi, Doctissimi, & Consultissimi Viri,



UOD tamdiu officio vobis testando ab-
stinuerim, & silentio meo adeò longin-
quam Epocham temporis inscribere de-
beam, admodum vereor, nè aut vestri mi-
nùs memor fuissè, aut ab observantiâ de-
bitâ, delcivissè videar, saltem extremam quandam so-
cordiam mihi obrepssè, nè suspicemini. Quibus cri-
minum

minum maculis abstergendis, nescio an chartæ istæ sufficiant, quas olim vestris oculis dicavi, & quas modò devotissimâ mente consigno. Quibus nugis, non sanè sine qualicunque industriâ, compingendis, quàm studium observantiam meam vobis probandi, penitus in causâ fuerit, à benignitate vestrâ obtinere non omnino despero, biennium integrum dormisse, vestri meique oblitus, apud vos, æquos rerum arbitros, nè reus peragar. Reverentiæ autem, quâ vos presequor, exile quidem, & inconcinnum, sed quale mea tenuitas fabricari potuit, monumentum extruere conatus sum, non merito suo; nec pretio operis, sed offerentis animo, vestrâque, si-quam indulgere arriserit, acceptatione æstimandum. De quo mihi abundè satisfactum erit, si quod ille à Pythiâ, ego à vobis (inclyto licet expuncto) audivero, Ἀλλά μοι ἔναδε χόνδρε ἀγακλῦς Ἑρμιονῆ. Sin ut absolvi capax sim, adhuc aliâ defensione opus est, penes me nullam fore agnosco, nisi ut peregrinationis meæ, ex quo Galliam reliqui, rationem, sincerâ & succinctâ narratione perstringam. Postquam à Lutetiâ auspicati, Galliâ ut potuimus celeriter transcursâ, Etruriæ portum attigimus, Romam jam indè ab initio præfixam itineri metam, properè contendimus; progressum intercepit Florentia, urbs claritudine suâ promerita, cui dierum aliquot moram impendat etiam festinus viator. Ibi vix triduum comoratos dum in urbis situ amœno, ædificiorum elegantia, & magni Ducis prodigiosis thesauris perlustrandis oculos pascimus, animos oblectamus, fama occupat de peste ad Neapolim grassari incipiente. Unde ansam arripiunt Itali (qui præter reliquos mortales pestem oderunt — *cane pejus & angue*) nos ab incæpto cursu deterrere, Romæ cum Neapoli commercia & necessitudines obtendere, facillimè serpens malum isthuc propagatum iri, quod si ibi versantes deprehendat, multa & magna incommoda se objicere, quibus difficile remedium, nullum fore effugium; itaque consultius esse paulisper Florentiæ transigere, rei even-

tum opperientes; si Neapoli deferbuerit calamitas, nec ultrà processerit, posse propositum tutò urgeri. His consiliis salutaribus obtemperatum oportuit. Subsistimus. Post mensem unum aut alterum eodem contagio laborare Romam, ex allatis nunciis certiores facti sumus. Hinc præcisa nobis spes, perplexa consilia. Utcunque menses duos vel tres, an transitura esset tempestas, præstolamur. Quum increbrescere constaret, & unius urbis tædium nos caperet, simul brumæ (quæ ibi aspera & incommoda esse solet) propinquititas discessûs moneret, quò nos vertamus ancipites consulimus. Regredi in Franciam non placuit: Genua nos fatiaverat: ad Venetias viæ prohibitæ, clausæ, interruptæ erant; nec eò, nisi per longas ambages, difficilesque anfractus, perveniri poterat. Nè vobis autem per hoc intervallum salutem officiosè impertirem, & instituti carminis seriem persequerer, obstabat, quòd nondum id à me exigere crederem, quòd illinc abundaret, hinc deficeret materia; præcipuè verò quòd interveniens occupatio, cujus opinor, non inscii estis, meditationes meas abrupit, donec aliò abeundum esset. Etenim quò dirigenda essent vestigia dum ambigere-mus, fortè innotuit deliberantibus, navim quandam robustam in portu Liburnico consistere versùs Constantinopolim mox vela ventis daturam. Hanc, opportunum rati, conscendimus (Quippe commodum se offerre diverticulum fatiscientibus; præstare apud Turcas paucos menses terere, novi aliquid contemplantes, quàm Florentiæ otiosos desiderare; ipem fore pestem brumali frigore temperatam interim desævituram, tum repetentibus Italiam iterum obstructa iri reſerata) Cujus velificationis cûrsu, pericula, circumstantias, ut potui accuratè, versibus descripsi, quorum spero ad vos jampridem pervenisse exemplar. Etenim ubi huc appuli, quid mihi incumberet, perpendere cœpi, quantum vobis deberem, quo pacto me exolverem. Consideranti nihil melius visum, quàm si quæ per hujusce digressûs curriculum observanti occurrerent, metris

commendarem; etsi quantum humeris meis fascem imponerem, non me fugeret. Protinus accinxi ad opus destinatum; & primò ipsius transitûs modum, ordinem, discrimina perpetuo contextu expedivi, quorum, ut mox innuebam, vobis pridem copiam feci. Dein paulisper respirare mihi concesso, aggressus sum, quæ de Turcarum historiâ, moribus, regiâ, religione pauca collegeram, in carmen conjicere; molimen arduum, & nescio an viribus meis expugnabile, quodque ad exitum perducere valuero; utcunque ut attentarem, Vicit amor vestri.—Nè frustra hæc dicere, & vobis vanâ specie illudere videar, hoc ex opellæ meditullio discerptum ἀποσπασμάτιον, quod licet stylo impolitum, inventione humile, dispositione indigestum, partibus mutilum (utpotè ἀκέφαλον, ἢ ἀτελές, & multa interponi desiderans) vobis tamen offerre ausus sum, veluti arrham reliquorum, nisi impar cœptis conatus, & interjectæ viæ asperitas cursum sufflaminet. Minimè judiciis vestris satisfacturum (cùm meo ipsius displiceat, & relegentem scripsisse pudeat) hoc tamen nomine boni consulturos spero, quòd ex animo vestri studioso proficiſcatur. Nec aliud quicquam habeo, quo diuturnum silentium excusẽ; si hæc veniæ impetrandæ suffecerint, mihi è votis successit. Superest pro reliquis hunc locum spectantibus patientiam vestram deprecari, donec quæ super his meditor, aliquatenus absolvere datum erit. Sed nè potiùs tanquam reus causam egisse, quàm epistolam scripsisse videar, de præſenti rerum statu pauca subjiciam. Vastissimum hoc Imperium, sub Rege juvene, administrat Prorex (Vezir Azem. i. supremum consiliarium vocant) vir penè septuagenarius, sed miro corporis, animique vigore præditus. Plus biennio effluxit, ex quo ille è mediocri conditione ad hoc fastigium evectus, regiminis habenas suscepit (raro horum temporum exemplo posse quenquam tamdiu in hoc officii præcipitio immotum persistere, quod plerisque instantis ruinæ præludium esse consuevit) intra quod spatium

tot tantâsque res gessit, ut suis unius vigiliis se debeant huic regno instauratæ vires, splendor restitutus. Foràs Ottomanici nominis terrorem, qui in contemptum exoleverat, resuscitavit, domi majestatem prostratam erexit, ordinem expulsum revocavit; Insulas Tenedon, & Lemnon, Turcis nuperrimè tanto cum suo dedecore extortas, recuperavit; Venetæ classis impetum retudit; Moldaviam & Valachiam, defectionem molientes, in ordinem redegit, provinciarum istarum principibus dejectis, novis substitutis; Transylvanos ad pacem, veniâmq̃ue orandas perduxit, nec supplicum conditiones admisit; Palmarium est quòd factiones intestinas, quibus graviter convulsa & quasi obruta imperii majestas, vires pessundatæ erant, penitus repressit; Equitum peditûmq̃ue primores, quibus solenne erat potentia suæ subnixos, Reip. statum permiscere, qui antehac multarum seditionum authores extiterant, & subinde novis excitandis intenti erant, hos palam autoritate suâ, illos clam & astu adortus interemit; quorum mille circiter, principes factiosorum, è medio sustulisse fertur, & vix paucos superstites reliquisse, qui dehinc mandatis regiis obniti, aut obmurmurare audeant; quo opportunæ severitatis remedio in præsens principi suum obsequium asseruit, & futurorum tumultuum radices excidit; ut hic ab imperio Turcico elogium meruisse videatur, quod à Romano Trajanus, tribuente historico, “ * Quæ omnia
“ eò majora videbantur, quoniam per multos, atque
“ atroces Tyrannos perduto atque prostrato statu Ro-
“ mano, in remedium tantorum malorum divinitus
“ credebatur opportunè datus. Habetur autem ut exquisitæ prudentiæ, maximæque experientiæ, ità ingenii perspicacis, animique excelsi; admodum propositi tenax, & consiliorum continens (quæ impertit paucissimis); temperamento cholericus, & iræ vehe-

* *Aurel. Vict.*

mens, nonnunquam violentior; præcipuè omnium providus, ac vigilantissimus, ut quamvis ipsi continuò tanta moles negotiorum incumbat, parcissimè, idque vestitus, dormiat. Severitate suâ, vel crudelitate, & tantum sanguinis profundendo, ab omnibus metui, à plerisque odium consequutus est. Hostem infensorem vix habiturus est Christianismus, utpote potentiæ Ottomanicæ promovendæ acerrimè intentum: quo stimulo accensus, (etsi quidam politicis altiùs immerfi, causas longè subtiliores assignant) Regem persuasit, ut propius cœptis suis patrocinium accommodans, ex Imperiali sede Adrianopolim commigraret, dein coacto exercitu numerofo contra Transylvanos expeditionem suscepit. Bello causam prætexit, quòd Princeps Ragotfi, Turcarum stipendiarius, ac proinde subditus cùm esset, suo injussu Poloniam invasisset, sibi regnum affectâisset, hinc honori Ottomanico accessisse detrimentum, nec talem injuriam posse dimitti impultam. Dudum in Transylvaniæ finibus versatur. Transylvani, cùm precibus nihil profecerint, vi illatæ se strenuè opponunt. Adhuc de successu armorum nihil admodum constat. Christianis imminentem procellam avertat Deus; nè vota respuat spem facit, quæ nuper in Asiâ emerfit, & continuò invalescit gravissima rebellio, ex hujusmodi origine. Hassan Aleppo urbis præfectus, vir magnæ famæ atque authoritatis, multisque quibus præfuit, rebellionibus clarus, à Prorege cum suæ provinciæ copiis ad bellum citatus, cùm simul advenisset, vitæ suæ insidias parari, suspicione an certis argumentis colligeret, periculum propulsare animo certus, primò iter protrahere, deinde sæpius provocatus, imperium detrectare cœpit. Interim dum Proregem occupant Transylvani, valido exercitu Asiæ incumbit, Regia tributa exigit, officia distribuit, omnia è mente disponit, ut populi favorem aucupetur, justitiam accuratè administrat, militum suorum (quos habet ad L. millia promptos & expeditos) licentiam cöercet: à Rege hostis, perduellis, infidelis promulgatus, ità se permanfurum

mansurum respondet, nisi justis postulatis satisfiat; Revertatur Rex Constantinopolim, imperii status reformetur, fuso sanguini vindiciæ persolvantur, à bellis non necessariis abstineatur, provinciæ desolatæ redintegrentur, & (quo votorum summa continetur) Visirius ambitiosus ac sanguinarius, unâ cum consiliorum particeps Musti (legum supremo interprete) loco amoveatur, vitâ privetur. Hunc obicem Visirio divinitus injectum credimus, nè is propriæ salutis prospiciens, ulteriùs Christianos bello persequi, & gladiis quàm pactis malit decernere. Græcis, ex quo hîc commoror, nihil novi accidit, nisi quod superiori anno, ipsorum Patriarcha supplicio affectus est. Parthenius ei nomen, & ex optimis fuisse dicitur, qui à multis annis hoc officio functi. Insimulatus est communicati cum Duce Muscoviæ consilii (quem Græci nunc fidei suæ columen primarium, futurum aliquândo libertatis vindicem existimant, Turcis proinde suspectiorem) Patriarcham plerique facinoris insontem arbitrantur, confictum ab æmulis sedem suam conscendere gestientibus, ut est hisce sacerdotibus in re angustâ grandis ambitio. Utcunque Visirius re parùm expensâ, in terrorem reliquorum, si qui talia agerent, virum è vestigio in publicum produci jubet, utque erat Pontificio habitu indutus, laqueo Spiritum præpediri, ita biduum lugubre spectaculum pependit. De religione ipsorum impræsentiarum supersedeo. Tantùm festis alacriter celebrandis incumbunt; sub acerbæ servitutis pressurâ hilares animos præferunt, cantant, saltant, & adhuc (uno verbo) pergræcantur. Ultimò restat, ut à vobis veniam implorem absentiae ultra justos triennii limites excurrentis. In quo non diffiteor me favore vestro fretum (quem & aliis indulgisse memini, & mihi non denegaturos præsumpsi) securitati & commoditati propriæ consuluisse. Quæ mihi ad impensas sustinendas rerum angustia sit, vobis satis perspectum; & quantæ abhinc in Christianum orbem redeunti difficultates & pericula sese opponant,

ego

ego experiētiâ, vos conjecturâ assequi potestis. Itaque quod hîc loci, quasi extra commercium humani generis, longiores moras extraxi, id mihi non tam voluntatis propensione, quàm ex cujusdam necessitatis præscripto accidisse, fidem, reor, astringenti præstabitis, cujus veritatis testes invoco, quotquot hætenus votorum mihi conscii sunt: Utinam verò cui tantis terrarum spatiis disjuncto obversantur——πολλὰ μέλαζὺν
 *Ουρεά τε (χιόεν)α, θάλασσά τε ἡχέεσσα, è re esset optare, votisque ineffet efficacia, equidem extra pomœria vestra nè unam horam perdurarem. Neque enim alibi terrarum liberiùs aut suaviùs rei literariæ——*cujus amor mihi crescit in horas*, vacare, aut usquam tot animas eruditas, honestas, ingenuas reperire potuero. Quæ sententia, quò mundum familiariùs intropicio, eò penitiùs animo infidet. Jam igitur, quum ex divinæ providentiæ benignâ dispositione mihi de reditu, ut videtur, incolumi nec incommodo prospectum sit, antequam sol unicam revolutionem emensus, in suam Libram se denuò restituet, me vobis præsentem sistere, & coràm pro tot acceptis beneficiis (quorum nunquam mihi excidēt memoria aut sensus) gratias persolvere spero. Quòd si pro veniâ præteriti temporis vos exorari finitis, & novi licentiam, quantum reverenti competat prorogare non gravamini, eò magis benignitati vestræ divinctus, alacriùs honori vestro studebo, felicitati applaudam: pro quibus tamen (ut merita vestra, mea officia postulant) vota, precēsque fundere non desistam, cum quibus valete.

Peræ Constantinopolitana

Cal. Augusti 1658.

Mr. Fr.

Mr. Fr. Willughby to Mr. Wray, about
the Year 1662.

S I R,

I Met with several Adventures in the remaining part of my Journey after I left you ; and amongst the rest with one very lucky one, of a new discovery of Medals. You may remember the Day we parted I had intended to have gone to *Cirencester*, but hearing by the way of a great deal of Treasure that was found in a Field, I presently conjectured it might be *Roman* Coin, and diverted my Course thither. The Field was near *Dursly* (a Town we left about a Mile of the left Hand as we rod from *Glocester*) where I found above Forty People digging and scraping ; and bought a great many Silver Medals of them, and one incomparable fair one of Gold, that had been found a little before. The whole History how these came to be discovered, I shall reserve till I see you. I thought to have made strict enquiry after the Snap-apple Bird, but falling very Sick at *Malverne*, I was forced to give over all.

Dr. Corneli from Naples to Mr. Wray
at Rome, 3 Kal. Dec. 1663.

Viro Eruditissimo Johanni Wray.

Thomas Cornelius S.

EGO interea' quid de Mannâ compertum habeam, paucis indicabo. Mannæ triplex genus provenit. Unum trunci Ornorum per rimas sponte exsulant, diciturque vulgò *Manna Corporis*; alterum quod

ex eâdem arbore incisionibus arte factis extillat, & *Mannam forsatellam* vocant. Tertium tandem in Fraxini frondibus colligitur, *Manna frondis* nuncupatur. Hanc plerique ex aëre in frondes nocturno tempore roris instar decidere arbitrantur; sed ego autopfiâ edoctus sum illam ex ipsis arborum foliis exhalari. Hanc Virgilius roscidi mellis nomine significavit, cum dixit,

Et duræ quercus sudabunt roscida mella.

Causa verò quamobrem ego ita sentiam non debeo reticere. Linteo circa vesperam fraxini frondes velaveram, ut dignoscerem num Manna frondibus extrinsecus adveniret; sed manè inventa sunt folia roscido melle imbuta, nec interea Linteo quicquam inerat, nisi quod ex frondibus illi adhæserat. Perperam igitur Matthiolus commentario in cap. 70. lib. 1. Dioscor. reprehendit Altimarum, qui Mannam ex fraxini foliis extillare docuerat. Tu vir sapientissime nostras has disquisitiones æquo animo accipe. Meque ut facis amare perge. Vale Neapoli iii. Kal. Dec. MDCLXIII.

Mr. Fr. Willughby to Mr. Wray.

S I R,

THE first thing I saw considerable after I left Montpelier, was a Spring of *Oleum Petroleum* at *Gabian*; at the same Place there is a kind of a black Pumice Stone, and a Medicinal Well. From thence we went to *Narbonne*, where there is some Antiquities; there having a very sore Leg, and not being able to endure Riding, I resolved to go forward by Sea, and went in a little Vessel down the River to the Sea Shore, where we expected good Weather almost a Week; in which time a Plaister of *Diapalma* cured my Leg: And the Mariners being out of hopes of a good Wind, we bought a pair of Mules

Mr. Fr. Willughby to Mr. Wray. I I

Mules for about five Pistoles apiece, and set forwards to *Perpintan*, *Colliver* and *Capo de Creux*. Between *Colliver* and *Capo de Creux* we passed the Frontiers without any danger, searching, or trouble at all, only at the expence of an *Escus* for a Guide. At *Capo de Creux* is the principal Place for the Coral Fishing, and tho' the Wind hindred us from seeing the Fishing, I saw the Instruments, and understood as much about it as if I had seen it taken out of the Sea. Thence to *Viçt*, where there is a Mine of Amethysts, which they call Violet Stones; by what I saw there, and learned afterwards, I make no question but Diamonds, Rubies, Iacincts, and almost all Precious Stones, grow just in the same manner as the *Bristol* Diamonds, Hexangular and Pointed, excepting Agate and Corneole, which may be reckoned among Pebbles. Thence to *Cardona*, where there is a Mountain of *Sal Fossilis*, which serves all the Countrey thereabouts; the best is hard and transparent like Crystal, so as they make Beads of it, and sell them very cheap at the Town. About the Mountain some Sea Plants. And now I would advise you by all means to make a little Tour in *Spain*, and see the *Oleum Petrol.* the Coral, the Amethysts, and the Salt Mountain; but to go no farther than *Cardona*, unless you resolve upon the *Canary* Voyage, or have a mind to an *Andalusian* Whore: But from *Cardona* to *Xvesca*, a great Town between *Saragosa* and *Tholouse*, where I heard Seignor *La Stannosa* has a very famous Museum; the Bookfeller that told me of it, said it would take up several Days to see all the Rarities: But very likely it is much lesser than the Fame. From *Xvesca* to *Tholouse*, where they say there is a Cave that hardens Bodies into a Mummy. In this Journey before you come to *Viçt*, as I remember, you will pass by *Aulot*; where in divers Caves there is *spiraculum* of Air, caused, as they imagine there, by the falling of Water. From *Cardona* I went to *Portosa*, where I

12 *Mr. Fr. Willughby to Mr. Wray.*

saw a Mine of Marble which they call Jasper. From *Portofa* to *Valentia*; *Gandia* where I saw the Sugar Canes, and Sugar Mills; *Chativer*, where there is an Aquæduct made by the *Moors*; *Caravac*, where there is a Cross that came down from Heaven; *Granada*, where there is a Palace of the *Moors* that well deserves a Journey of a dozen Leagues. Thence to *Sevil*, where I attempted in vain to get a Passport for *Portugal*. I thought then to have gone to *Cales*, from thence to *Tangier*, and from *Tangier* to *Lisbon*, which was the best way to get into *Portugal*; but being discouraged by my Mules ill Fortune, and the time of the Year, I faced about, and returning by Land ***** *Toledo*, *Madrid*, *Burgos*, *Vittoria*, *St. Sebastian*, *Bayonne*, *Bordeaux*, *Blais*, *Sainctes*, *Poitiers*, *Amboise*, *Blois*, *Orleans*, and got hither almost a Fortnight since. This Journey of almost a thousand Miles, I came all alone, having agreed with my Merchant to leave him either at *Sevil* or *Lisbon*: And, I thank God, escaped very well all along; but at *Vittoria*, and the Passage near *St. Sebastian*, was basely troubled with Searchers: If you come that way you must manifest your Money, at least all your Silver, and take a Pass. Between *Bayonne* and *Bordeaux* I got a great many Notions about the making of Turpentine, Rosin, Pitch, and Yonderone, which I think is Tar, the Countrey being full of Pines. About *Bayonne* and *St. Sebastian* they catch a great many Whales every Winter; I got there some uncertain Notions about the *Sperma Ceti*. The buying of Horses or Mules is an excellent way, and you will find it will turn to very good Account, and save a great deal of Money, if you don't go higher than five or six Pistoles a Horse. At *Sevil* I found a Letter of Dr. *Wilkins's*, who very importunately persuaded either you or me to make a Voyage to the *Pic of Tenariff*, and that if ***** home, and you would undertake it, the Royal Society would defray all your Charges, and send you to *Cales* all necessary Instruments,

struments, and a Catalogue of the Observations they desired to have made. The *Pic* is only to be ascended in *June* and *July*. When you come to *Orleans* I hope you will take exact Notice of *Joan of Arles*, and *Charles 7*. Statues upon the Bridge; I saw them as I passed by, but took them for some Superstitious Foppery, and did not at all regard them. I hope you will all along get the exact Government of all the Towns.

Mr. Barnham to Mr. Wray.

S I R,

YOURS from *Montpellier*, *Jan.* the 10th, *S. V.* came to my Hands on *Feb.* the 6th following, and was answered on the 9th, wherein you give me so great Encouragement to employ you by way of Information, that I cannot forbear the annexing of this to the other Inquiries I gave you in my last; and indeed though last in order, yet I could wish it may be the first in execution. The thing is this: There is a certain Woman in the World, whose Name I am obliged to conceal (altho' possibly you would guess it if you were in *England*) that hath for this two years laboured under the affliction of a Belly that hath grown bigger and bigger, and is now much bigger than ever she was when she was with Child, (for she hath had two Children) she went up this last Week to *London*, to try all the Advice that Place can afford, having failed of a Cure in the Countrey: The Concern I have for her, which indeed is exceeding surpassingly great, hath made me transgress the bounds of Modesty so far, as to desire of her in Writing her own Observations of her Malady, together with the Alterations she hath found in her *Pudendis*; which,
not

not without much difficulty, she did send me Yesterday, after many importunities. I hope God will forgive me my Curiosity, being chiefly led thereunto by an Opinion, or secret Impulse, that you with the Advice and Information of what you may meet withal abroad, may be the Author of her recovery. She says, in her own Letter, to me thus; That she hath grown bigger and bigger this two Years, as I told you before, and that her Belly is constantly very hard; she did *γυναικοδιῆναι hoc est per menstrua purgare more debito*, until the beginning of last Summer, when she was advised to drink *Epsom Waters*; which she did for some time, until she found great inconveniences by them: for ever since she hath had *suppressionem mensium*; and, moreover, presently after her coming from *Epsom*, she felt a thing come down just like a Bladder, and bigger than her Fist, and hath lain upon the Neck of her Womb ever since; and upon the least walking or straining comes out fuller, and when she lies down goes in farther than a Woman's reach; so are her own Words. She saith she is free from any Pain in those Parts, only she hath a great weakness, so that she cannot stand much, especially after Purging. Her Navel is puffed up bigger than a little Egg clear above the Skin. She says that the Doctors and Midwives cannot determine what it is that comes down so, some say it is the Mother. She saith moreover, that she feels no Pain either in her Belly or Back, only Stiches fly up and down that are ready to take away her Breath. She seldom or never breaks Wind downward. This is all she tells me in her Letter, and I do believe you have a larger Account of her Disease than her own Physicians; her Bashfulness is so much, that it will not suffer her to discourse with her own Sex in this Matter freely: I have most exactly, according to the meaning of her Letter, transcribed her Sense, and chiefly her Words, where Modesty will give me leave.

leave. I know I need not provoke your Diligence and Industry in this matter, to make all inquiries where you come after any thing that may do her good. The Compassion of your Nature will prompt you to so charitable a Work : She is a Person of some Quality, and I am sure will have a due Sense of her Obligations to you. The Sickness last Week at *London* was but 28, God be praised.

Mar. 13th, 1665.

Mr. Lister to Mr. Wray.

M. Lister D. Wray suo. S. D.

DE Historiâ naturali Aristotelis ita censeo, cum hominem Philosophum præclare agere : sed egregius vir minimè satisfacit tantis facultatibus atque adjumentis, quorum meminit Plinius ei præstita fuisse ab Alexandro. Certè in his præcipuè rebus, quibus me quotidie exerceo, turpissimè illum errare deprehendo, neque sanè id mirum cum præclarissimus author summum suum ingenium consulere maluit, quàm res ipsas. Illud manifestum, eum paucissimis experimentis fuisse contentum ut immensam structuram exædificaret. De Plinio tu mihi abundè satisfacisti superioribus tuis literis : adeoque tuum judicium à diligentissimâ lectione vehementer complector approboque. Ad nostros homines venio, quorum, in primis ingeniosissimus juxtà ac diligentissimus scriptor Aldrovandus (nam Albertum, Cardanum cæterosque id genus homines stomachor valdè, quòd me planè operam perdidisse sentio, quam iis évolvendis dederim ; nisi quòd id profecerim, quàm licere homines doctissimos ineptire, qui ultra apparatus velint Philosophari.) Sed ad Aldrovandum redeo, virum sanè mirificum,
cui

cui tamen ægrè fero istos locos suos communes ; mallem equidem substituisset corollas de suo seque dignas. sed id moris est hominum, immensam lectionem & industriam ostentare malumus, quàm accuratissimè in paucis eisdemque nostris sapere : à quo tamen major fructus aliquando sperandus est in auxilium vitæ, ne dicam, nostræ laudis. Ante eum pro ratione temporum oportuit me dixisse de Whottono nostro, nisi quòd ab eo primò didici talem authorem extitisse. Elegantissimum suum opus tandem comparavi evolviq̃ue, is mirabili planè industriâ summoque ingenio usus. est in extricandis Veterum sententiis. Tabulas nostras ante confeci, quam cum nactus sum ; at mireris, quantam voluptatem conceperim, cum eas contulerim cum differentiis Whottoni. Hunc excipiat Moufetus item noster, à quo omnia præclara & consummata quis non expectet, cui tanta adjumenta, tantaque nomina contribuerunt, Whottonus, Gesnerus, C. Clusius, Pennus, Knivettus, Bruærus, &c? Profectò universum Theatrum suum adeo confuse & sine ordine condidit, ut quæ ei materies ab aliis, turpissimè collocatur, & minimè in laudem tantorum virorum. At non solum ipsam rem ferè ignoravit, verùm etiam barbarè omnino exponit. Sed ea homini imperito & benè volenti condonare possimus, nisi alia planè res contrà suaderet, cui equidem in legendis autoribus multum tribuo studeoque, ut sc. intelligerem, qui sit eorum animus honestusne & probus. At ex ejus scriptis aliud apertè cognovi, quòd satis mirari nequeo, arrogantiam sc. hominis, ne quid gravius dicam, qui cum infinita penè, præsertim de naturâ istorum minutorum animalium totidem ferè verbis transtulit ab Aldrovando, tamen nusquam ejus ingeniosissimi viri (si quis alius nostri seculi) mentionem facit. Ediderat autem Aldrovandus opus suum ante triginta annos quam hæc in lucem prolata sunt. Pauca ea, quæ de his rebus scripsere F. Imperatus, F. Columna tantis viris planè digna sunt, Moufeto

feto ***** neminem legi præter *Geodartium* Batavum, cujus certè industria summè laudanda est. Nam præter elegantissimas figuras, quas appingi curavit, singulorum animalium cibatum, transmutationumque tempora, accuratissimè notat; ut tantùm apud eum desideretur eorum exacta descriptio; is autem præter nuda familiæ nomina ne verbum quidem addit. Me olim judicium tuum elicuisse memini de Kerchero: is in tractatù, *mundus subterraneus* nominato, inter alia, de horum animalium productione spontaneâ pluribus verbis agit; quæ tamen res omnino an fiat in universâ rerum naturâ, dubito vehementer. Testimonia *Aldrovandi*, &c. nihili sunt. Ego plura expertus, quæ contrarium vel evincant, vel erroris certè causas declarent; quæ tu alio tempore, à me expectabis. In extremis ea accepi, quæ in actis illustrissimæ societatis vestræ lego. Ubi in primis præclarissimum specimen ingenii sui edidit *D. King* de Formicâ. Habes quæ scire potui de scriptoribus minutorum animalium, eâ judicii libertate, quæ nostræ amicitiae sit. Si qui sint qui nostram cognitionem adhuc lateant, fac me de iis certiores. Et velim ut tuum judicium interponas tum de his quorum suprâ memini tum de iis quæ restant. Item rogo digneris quàm plurimis verbis mihi perscribere, quum, commodo tuo fiat, quid tu existimes de optimo genere harum rerum tum observandarum, tum tractandarum. Nam ferè totus sum in his novis nostris delectationibus. Vale & nos ama.

Burvela agri Lincolnensis, viii. Cal. Aprilis.

Mr. Wray to Mr. Lister, Fellow of St.
John's College, Cambridge.

S I R,

ARRIVED here (*viz.* at Cambridge) I found a Letter from you, the reading whereof gave me no small content, it containing Expressions so significant, and full of heat and *πάθος*, as certainly nothing but sincere Love could dictate; sure they must needs be a true Copy of your Mind, and not Words of Course and Complement: Only I could wish you had been more sparing in what refers to my Commendation; for though I would not refuse the Testimony and Praise of Persons who are themselves Praise-worthy, where there is just Ground and Reason for it; yet not when it exceeds the Merit of any thing I dare own, nor for such Qualities as I am not conscious to my self of; which gross self Flattery must needs much blind me if I did not quickly discern to proceed rather from Affection than Judgment. I rejoyce much that you still pursue the Study of Nature, not only because of the propensity I my self have to it, and consequently to love such as agree with me; but also because I judge you to be a Person, to speak modestly, as well qualified as any I know in *England* for such an undertaking; and so likely to make the greatest Advance and Improvement, you having taken the right Course and Method; that is, to see with your own Eyes, not relying lazily on the Dictates of any Master but your self, comparing things with Books, and so learning as much as can be known of them. I do not wonder a Man so inquisitive should make some Additions to the *Cambridge Catalogue*. *Hieracium rectum rigidum*, it's not unlikely you might find about *Burwell*; but it seems somewhat strange you should there meet with *Alchimilla vulgaris*, I having not to
my

my remembrance ever met with it in *England* elsewhere than in Mountainous Places, as *Westmoreland*, *Wales*, *Darby*, *York*, and *Staffordshire*, &c.

Those Remarks you mention you would oblige me much to communicate, I being very fond of seeing any of your Productions.

I was much pleased to understand, that you do not confine your Studies and Enquiries to Phytology only; but take in Zoology, and the whole Latitude of natural History. *Lincolnshire* for Fish and Fowl, affords you a large Field, yet it is very much that in one Winter you should meet with upwards of 50 Species, and I wish I had the sight of your Descriptions, which I doubt not to be very exact; but because they cannot easily be transmitted, I shall only desire a Catalogue of their Names, that so I may know what there are I have not yet met with.

Middleton, June 18, 1667.

Mr. Lister to Mr. Wray.

M. Lister D. Wray S.

PRIDIÈ vesperi insectum Animal admodum lucens in aëre vidi, cepi, notavi, scripsi. Ratione lucis *Cicindela* meritò appellanda est: sin autem propius & claro sole animalculum perspexeris, Scarabæorum tribu familiâque esse diceres. Corpore erat parvo, longiusculo, tenui, æqualitèr lato; quoad superficiem, lævi planoque; quoad colorem, alas, alarumque thecas, caput, fusco aut pullo. Tegumentum capitis clypeum inversum lepidè imitabatur. Caput subtèr, ratione & operculi sui, & corporis, minimum erat, (atque hinc tegumentum ejus ad latera sua perspicuum) à duobus nigerrimis splendentibusque oculis dispartitum. Caput duæ brevissimæ tenuissimæque Antennæ ornabant. Humeri nulli; nam suprà, tegumen-

to tantum, alarumque thecis, destinguebatur animalculi corpus: subter, aliter res se habet. Tres pedum tenuissimorum ordines, ad fabricam & similitudinem vulgaris muscæ nigræ facti: quorum duo mox infra caput rubenti collo inferebantur. Tumet thorax, rotundus, lævis, splendens; cujus basi alterum pedum par adhærent. Denique venter sex annulis imbricatum venustissimè dispositis constabat: quorum ultimis iste liquor bipartitus ad instar aquæ marinæ lucens micansque inerat. De die caput sursum tollere gaudet: lentè & rarò se loco movet: Utrumque more Bufonis. Vale.

Col. Divi Johannis, 6^o Cal. Julii 1667.

Mr. Dent to Mr. Wray.

S I R,

MR. *Mayfeild* could not procure any dry'd Mayds or Thornback at the Mart, he helpt me to a fresh Thornback, which he said was full grown, its weight was 10^l. it was Female, and had very many Eggs in it, all exactly round, of different bigness; the largest as big as a little *May Cherry*, paler colour'd than a Hens Egg, of that bigness, otherwise not different to the Eye. I have dryed the Fish a little with Salt, &c. yet not so much but that it will recover its Form if soaked in hot Water. The Tail (a Foot long) was cut off (as usually) when caught, which (they say) was full of pricks, both above and below, to the very end. *Maydes* (they say) are of two sorts, the larger sort (much smaller than Thornebacks) properly called *Flayre Maydes*; smooth as Flayre, pale colour'd, not dappled or waved; the less call'd Thorneback Maydes, full of pricks, dappled, but paler colour'd than the Thorneback. It seems a full grown Flayre is a very large Fish; Mr. *Mayfeild* told me

me he sold one to the Cook of St. John's College of Two Hundred Weight and upwards, and that it served all the Scholars of the College at that time, being 30 Mefs for Commons; which was likewise confirmed to me by the Cook of the same College. There are Male and Female of all these four Sorts. I cannot understand that these four do differ at all in shape of Body, but only in proportion, colour, and smoothness of Skin or Prickles. With the Fish I have put up in a Box some Water Fowl, viz. a Pocker, a Smew, three Sheldins, a Widgeon, and a Whewer; which two last are Male and Female of the same kind. Widgeon is never apply'd to the Female Sex: Its usual to call a silly Fellow, a *wise Widgeon*; or to say, he is *as wise as a Widgeon*; and a Drunkard's Song saith, that——

*Mahomet was no Divine, but a senseless Widgeon,
To forbid the use of Wine unto those of his Religion.*

It is usual to say of one of a large Size, *Sure the Dam of that was a Whewer*. We could not meet as yet, with a Pintayle; my Cousin tells me it is somewhat less than a Whewer, of lighter Gray colour, the Wings and Tail longer, and sharper pointed, the Bill longer and narrower. I have put up some hollow Bones which are annex'd to the Windpipe of each Male; for in Females I can find none otherwise than you will find in the Paper writ upon, Whewer. The difference of Shape of these Bones doubtless causes their different Tones. If you steep one of the Sheldin's Windpipes a while in warm Water to make it lax, you may observe the pretty Motion to be found in the middle Protuberance, and pick out a little Philosophy from it. Whenever I find any farther opportunities of serving you, I will approve my self, &c.

Cambridge, Feb. 15. 1674.

Mr.

*Mr. Lister to Mr. Wray.**M. Lister D. Wray suo S.*

DE Valetudine tuâ incommodâ vehementer movebar. Etenim cum summam tuam temperantiam atque abstinentiam tam probe scirem, omnia de te pejora metui. Idque eâ de causâ loquor, quod mihi non parum errare de victus ratione videbaris. Is quantum meminerim (teque in eâ re, cum Monspelii ad eandem mensam diu hospites unâ fuerimus, religiosè observavi) parcissimus, scrupulosissimus. Accedit illud tibi, jejunia frequentia, longissima: & ut pauci cibi es, ita & rarissimi corporis habitus.

*x Cal. Octobr. 1667.**Mr. Wray to Mr. Lister, in answer to the preceding Letter.**J. Wray D. Martino Lister suo S. D.*

Symptoma illud de quo non ita pridem apud te conquestus sum (Deo gratias) non ingravescit sed remittit potius: Me tamen ab eo penitus liberatum iri vix est ut sperem, adeò teneri sunt (ut nôsti) & putredini obnoxii pulmones, ut siquam semel labem contraxerint, difficulter admodum in integrum restitui & percurari possint. Quod me in victus ratione (quam justo tenuiorem instituere putas) errare, eique rei partem aliquam mali quocum confictor imputandam censere videris, ignoscas si sententiæ tuæ non accedam. Absit ergo ut ego temperantiæ laudem, quæ mihi nulla debetur, affectem, aut delatam ultro amplectar. Reliquia quidem animalia rationis (ut vulgò creditur) expertia, quæ secundum naturæ præscriptum & instinctum degunt, & alimenta nullâ arte præparata, qualia
natura

natura iis subministrat accipiunt, in cibo capiendò nec legem observant, nec modum tenent, nec statis temporibus vescuntur. Verùm cibus quo illa utuntur, & excrementi multi est, & succi pauci, unde & illum sine errore aliquo aut noxâ insigni copiosius ingerere possunt. Deinde quoniam parcâ manu, sponte suâ, nullo culturæ mangonio stuprata illum suppeditat alma tellus, multùm se exerceant oportet, multumque temporis impendant in illo conquirendo; unde nec si velint in excessu facilè peccare possunt. Hinc feræ & sylvestres animantes rarò ultra modum pinguescunt, nec admodum libidine turgent, sed statis duntaxat temporibus, semel ut plurimùm in anno ad Venerem incitantur; suntque admodum vivaces, & morborum plerunque expertes. Nos certè (me iudice) valetudini nostræ meliùs consuleremus, si illorum exemplo, victu simpliciore & viliori uteremur, iisque cibis quibus ventriculum implere modicèque distendere fas esset. Quòd *Gesnerum* & *Aldrovandum* consulueris, & eorum descriptiones cum tuis diligenter contuleris, rectè & ex ordine mihi fecisse videris; paucissimas certè Aves invenies quæ illorum diligentiam effugerint.

Dabam Notleia Cal. Octob. 1667.

Mr. Wray to Mr. Lister.

Joannes Wray D. Martino Lister suo S. P. D.

QUòd Veteres Latinos Medicos pervolvere in animo tibi esse scribis, mihi admodum probatur; namque siquid ego iudicio valeo, iis legendis plurimùm proficies, magnùmque operæ-præteritum facies. *Cornelium Celsum* & ipse legi. Est ille optimus Latinitatis autor & Medicinæ veteris satè gnarus, quamvis ipse (ni malè memini) professione & usu medicus non fuerit. *Scribonius* mihi nunquam lectus est, *Pli-*
nium

nium secundum summi ingenii virum tibi commendare (quem nemo sc. vituperat) superfluum & inep- tum foret. Est autem ipsius opus nihil aliud quàm Pan- dectæ, in quas congeffit quicquid uspiam apud Vete- res seu Græcos, seu Latinos exteróve legenti occur- rebant argumento suo convenientia, temerè & sine de- lectu, nullóque judicio adhibito. Plurimum certè il- lius industriæ debemus, qui è monumentis Antiquorum plurima ad historiam naturalem pertinentia commen- tariis suis inferendo ad nos derivavit, quæ aliter inju- riâ temporum cum Autoribus suis penitùs intercidis- sent. Nec tamen meritò vituperandus est, quòd nullo discrimine vera falsis admiscet; liberum enim unicui- que judicium relinquit; finem suum affecutus, quòd omnia quæcunque à Græcis aliíve literis prodita inve- nerit sine invidiâ Romanis suis communicârit. Video te Romanarum Antiquitatum scriptores & vindices præ manibus habere: Plurimos ejus generis Autores vidi: quem cui præferam non video. Inter alios J. *Lipsius* præcipuam laudem meretur, qui de militiâ Ro- manâ, de gladiatoribus, de Amphitheatris, &c. fusè tra- ctavit, additis etiam ad majorem illustrationem figuris æneis. Est & *Casalius* quidam Romanus qui de pro- fanis Gentilium ritibus copiosè egit, adhibitis etiam iconibus. In hoc libro quæ ad sacrificia pertinent, vasa, instrumenta, & reliquus omnis apparatus, traduntur. Est & *Tomasinus* quidam Italus qui de annulis anti- quis, de Tesseris Hospitalitatis aliisque quibusdam trac- tatus edidit. *Lazarus Baysius* olim de re Vestiariâ & Navali scripsit, at breviter. Urbis antiquæ situm & mo- numenta, quorum partes aliquæ vel rudera etiamnum supersunt, nimirum templa, porticus, amphitheatra, bal- nea, obeliscos, columnas, aquæductus, circos, &c. de- lineârunt & descripserunt plurimi, at Italicè plerique. Quo ego usus sum liber 2^{bus} parvis octavi folii tomis comprehensus, *Roma antica e moderna* titulum habet: quem quia viliori pretio parabilis est, tibi etiam com- mendo, ut qui linguam Italicam probè calleas. Figuras
quamvis

quamvis in minori formâ non inelegantes rerum præcipuarum de quibus tractat inibi reperies. Sed manum de tabulâ, de his aliisque si opus sit plurâ cùm Londini fuero; interim vale & me ama.

Dabam Notleia iv. Idus 8bris, 1667.

*Mr. Wray to Mr. Lister, at St. John's
in Cambridge.*

D. Martino Lister J. Wray S. D.

Literas tuas iv Id. Novemb. ad me datas non sine tacitâ quâdam admiratione legi; adeò eruditæ mihi visæ sunt, adeò eleganter & ad amussim scriptæ. Felicem me qui talem amicum habeam & studiorum æmulum, maximo mihi adjumento futurum, & Reip. literariæ ornameto. Quid enim de te sperare nefas? qui tantos jamjam in bonis artibus & literis progressus feceris, atque in id fastigium evaseris, sive rarâ quâdam ingenii felicitate, sive studio & industriâ, quod studioforum vulgus maximâ contentione nequicquam anhelat. Rem sanè difficillimam planè consecutus es, ornatè dicendi scribendique facultatem; adeò ut de Latini sermonis puritate, deque stylo expoliendo tibi ampliùs laborandum non sit, cùm in his tantopere excellas aliisque æqualibus tuis palmam facilè præripias. Hanc mihi confessionem res ipsa extorquet; hanc tibi debitam laudem ni tribuam, invidus censerì debeam & amici titulo indignus. Dominum *Willughby* non est cur tibi conciliare studeam, cùm bonos omnes & eruditos tuique similes sponte suâ amplectatur, omnibusque officiis demereri sibi que devincire gestiat. Scribonium ut legere aveam commendatio tua effecit. Verùm liber ille non ubique est obvius, aut paratu facilis. Cùm primum mihi ejus copia facta fuerit, lectionem aggrediar. Dubia illa quæ tibi occurrunt, & legentem morantur, næ erras vehementer, si me posse sol-

vere tibi que eximere putas. Quid sibi velit autor ille cum *Hypocistidem* definit Rosæ sylvestris succum, &c. divinare non possum. Bauhinus noster aliique Botanici *Cistum* fruticem ob floris cognationem juxta Rosam collocant; nemo tamen Rosam caninam appellat; ni fortè pro *caninâ*, *marina* substitui debeat. Nam Cæsalpinus, ut citatur à J. Bauhino, *Cistum* quondam *Rosam marinam* appellari scribit. At nè sic quidem rem expediemus, cum Hypocistis non ipsius Cisti succus sit, sed plantulæ cisti radicibus adnatae, quæ Hypocistis dicitur. Pro Oxytriphyllo Scribonii aliam longè diversam plantam nobis exhibent Lobelius & Clusius, magna nomina, nimirum *Lotum pentaphyllum siliquosum villosum* C. B. ut apud eum in Pinace videre est: utcunque ego judicio tuo plurimum tribuo, tuamque sententiam probabilem existimo, quoniam illud facultate aliquâ insigni pollere vel bituminosus odor fati arguit, quum in hoc nec odorem nec saporem aliquem excellentem observaverim. *Opium* quin præstantissimum sit medicamentum, præsertim extrinsecus adhibitum, nullus dubito, in eo tamen intus sumendo summopere cavendum est nè erres, aut modum excedas; nam ex frequentiori Opii usu, quantumvis optimè præparati, funesta tandem symptomata consecuta esse tristi multorum experimento fati constat. Quod in omni sanguinis eruptione artus constringi verat, utris similitudine deceptus errare videtur. Quod verò per venam, animalis arteriam intelligat, verisimile est, quoniam Romani tum Venas tum Arterias communi nomine Venas dixerunt: nec in vasis hisce distinguendis curiosi fuerunt, tantum abest ut circuitum sanguinis illos vel per nebulam vidisse concesserim. De Fungis cum te, Deo dante, videro, pluribus agemus. Quod in studiis rei naturalis tam constanter perseveres, & institutum pertinaciter urgeas, te plurimum laudo. Rem sanè curiosissimam te nuper observasse narras, nimirum *Cochleam* cujus spiræ in diversam partem flectantur, cum inter

ter doctos constans opinio sit, à septentrionali æquatoris parte cochleas omnes (motum sc. solis observando) à sinistrâ dextram versùs torqueri. Nec ego unquam inveni qualem tu describis. Sive ergo aliæ sint hujus generis, sive hæc sola exceptio sit, & diligenter servari, & exactè describi, depingique mereatur. Ni mora in hâc urbe mea incerta fuisset à te illam petiissem, ut Regali Societati (cujus nuper particeps factus sum) monstrarem. Die Lunæ proximo (favente numine) Suffexiam petam Londino relicto, ubi vanis pollicitationibus nimis diu detentus fui.

Londini ix Cal. Decembr. 1667.

Sir Phil. Skippon to Mr. Wray.

S I R,

THE Dean, [*Wilkins*] says he, is confident no Man can translate his Book [*Real Character*] better than your self. Yesterday the Transfusion of Blood was experimented upon the same Body they hired at first: They let out 8 or 10 Ounces of his own, and then transfused of the Sheep's arterial Blood about 14 or 16 Ounces. There was a great Company present. The sweet smelling Earth found in Captain *Massey's* Garden in *Hogsdon*, you have heard of already; an Oyl has been extracted which smells sweet. The *Journal des Scavans* relates, that *Cassini* hath discovered and described the Motions of *Venus* about her own Axis.

Dec. 13, 1667.

Sir Phil. Skippon to Mr. Wray.

S I R,

THE Effects of the Transfusion are not seen, the Coffee-Houses having endeavoured to debauch
E 2 the

28 *Sir Phil. Skippon to Mr. Wray.*

the Fellow, and so consequently discredit the Royal Society, and make the Experiment ridiculous.

Sir Phil. Skippon to Mr. Wray.

S I R,

Y Esterday there was a Letter read from Dr. *Sampson* (who is at *Leyden*) to Dr. *King*, giving some notable Observations in the Anatomy of a near the *Bodensee*. Dr. *Lower* shewed the Cause of blindness in Horses, which is a spongy Excrescency that grows in one, sometimes in two or three places of the *Uvea*; which being overgrown, covers the Pupill when the Horse is brought into the light, but in a dark Stable it dilates again. A tryal was made, whether a piece of Iron touched by a Magnet would weigh more then it did before it was touched: This succeeded not. A Present was sent from Mr. *Colpresse* (I think) who lives in the *West*; being a Box full of the several Mineral Stones, Clays, &c. observed there. Mr. *Hooke* has improved the Pendulum Watch, by making the simple Vibrations promote the Circular Motion. It is hoped the Coll. they have designed below *Arundel* House, towards the Water-side, will be finished by next *Michaelmas*. Dr. *Moulin* translates the History of the Royal Society into *French*.

London, Jan. 24. 1667.

Sir Phil. Skippon to Mr. Wray.

S I R,

IT is somewhat difficult for me to explain in Writing the new way of Pendulum. There is the common

common Vibration that *Hugenius* invented in Watches, and Mr. *Hooke* hath to that added a Circular Motion; the weight at the end of one Vibration is turned off by a kind of a Spring, which makes the Motion circular. The most considerable Experiment Yesterday, was the weighing of 1st Tin, 2^d Copper, 3^d Tin and Copper equally mixt together: These three severally were of the same weight in the Air, but in Water the mixt Metal weighed much lighter than the other two. A new Book of Dr. *H. Moor* is come out, which he calls *Enchiridion Ethicum*.

Feb. 21, 1667.

*Mr. Wray to Mr. Lister, at Burwell in
Lincolnshire.*

Jo. Wray D. Martino Lister suo S. D.

Sententiam tuam de autoribus iis qui de Insectis commentati sunt, in plerisque probo. Aristoteles, quamvis egregius autor, confusus esse videtur aliquando & obscurus, & in quamplurimis à scopo aberrat. Qui tamen supersunt historiæ animalium libri non sunt integrum Aristotelis de hâc materiâ opus. Cùm Plinius (ni malè memini) quinquaginta voluminum meminit. De Aldrovando, Alberto, Cardano, juxtâ tecum sentio. In Wottoni opere non admodum versatus sum; video tamen illum ex antiquorum scriptis hausisse quicquid ferè in illud volumen contulerit. In Mouffetum nimis iniquus videris: nam & ille, me judice, non malè meruit de repub. literariâ, & pleriq; viri docti mihi suffragantur. Goedartium mihi nondum videre contigit. Kircheri judicium nihili facio; an verò Insecta quædam spontè oriantur necne, determinare nequeo. Præter hos qui de insectis scripserunt, alicujus nominis aut pretii nullos novi: vidi aliquando in Sicilia

liâ opus manuscriptum D. Castelli Romani in duos tomos divisum. Volumen satîs spissum & grande cum figuris propriâ ipsius manu delieneatis, quod nescio an unquam lucem publicam visurum sit.

Londini xiii. Kal. Maii. 1668.

Mr. Wray to Mr. Lister at Cambridge.

J. Wray D. Martino Lister suo S. D.

Proxima statio fuit Sheffieldia in comitatu Eboracensi. Ibi à veteri amico D. Jessop perbenevolè exceptus sum, in cujus ædibus etiamnum diverfor. Quid tibi inquires illic negotii. Dicam quod res est. Scis me Phytologiæ studio deditum esse, & catalogum Angliæ indigenarum stirpium jamdudum meditari, quem ut tandem absolutum & omnibus suis numeris perfectum reddam, nullis laboribus parco, quin quotannis æstivis mensibus profectiones longinquas, etiam in remotissimas hujus regni provincias suscipio, quatenus facultates suppetunt, ad plantas indagandas. Hâc æstate Australes Eboracensis provinciæ tractus & Westmorlandiam mihi lustrandas proposui, quod & jam feci, duabus in eo itinere consumptis septimanis. Nondum tamen, quod dolet, incidi in quasdam stirpes, quas in iis regionibus spontè provenire certa fides mihi facta est. Ea sunt, Bistorta minor, Christophoriana, Pyrola Alfinis flore Europæa, Calceolus Mariæ, Thlaspi Globulariæ Folio *J. B.* aliæq; unde nec mihi adhuc penitùs satisfactum est. Hinc ego in Sheffieldiâ, ubi ad æquinoctium usq; manere in animo habeo.

Dabam Sheffieldiæ ex ad. D. Jessopp Broomhall dictis 7. Kal. Augusti 1668. i. e. 26 Jul.

Mr. Wray to Mr. Lister.

J. Wray D. Martino Lister suo S. D.

EGO, ex quo huc veni, partim Physicis, partim Mathematicis studiis memet exercui; siquidem D. Jessop mathematicis imprimis delectatur, in quibus non contemnendos sanè progressus fecit. Quo consilio hoc iter susceperim tibi (ni malè memini) antea aperui; & res sanè ex voto cecidit, quamvis nondum penitùs institutum absolverim, aut invenerim omnes quas quæsierim plantas, quasq; in septentrionalibus hisce regionibus provenire certa fides mihi facta est. Quænam inquires sunt illæ? Androsace altera Matthioli minor, Valeriana Græca, Thlaspi Globulariæ folio *J. B.* Pyrola Alfinis flore Europæa, Polygonatum baccâ nigrâ simplici, flore unico fimbriato viridi *D. Merret.* Bistorta minor, A Sort of Nasturtium folio tenuiter dissecto, &c. Cùm verò tot adhuc species exquirendæ supersint, ne me nihil omninò egisse, aut nequicquam hoc itinere profecisse suspiceris; adjiciam earum nomina quæ mihi noviter hâc primùm æstate observatæ sunt. Sedum ericoides *J. B.* in summitate montis Ingleborough. Bursæ pastoris loculo oblongo affinis, pulchra planta *J. B.* in Montosis circa *Settle*, & *Ingleborough* & alibi in regiunculâ Eboracensi *Craven* dictâ. Gallium cruciatum *J. B.* in Westmorlandiâ prope *Orton* & alibi. Filix pumila Saxatilis 2^a *Clus.* ibidem in muris & locis ruderatis: Cratægono Euphrosynes facie similis n. d. quod sciam, propè *Orton*. Sedi aut Cotyledonis nova species in rupibus *Wrenose*. Descripsi præterea accuratiùs alias aliquammultas quas olim inveneram, nimirum Filicem quandam Petræam crispam elegantem, sive Adiantum album floridum mihi dictum; Sedum Alpinum angustifolium luteum; Sideritidem hirsutam arvensem; Geranium Batrachoides alterum fusco simile; Rosam
pomi-

pomiferam fructu spinoso majorem. Ostensa insuper mihi sunt ab aliis, Meum vulgare in Westmorlandia, viâ inter *Sedberg & Orton*, magnâ in copiâ; Christophoriana, in Sylvis *Haselwood* Eboracens. Pyrola vulgaris ibidem. Helleborine flore atro-rubente variis in locis. Bistorta major vulgaris hic passim provenit in pascuis: Omitto Padum Theophrasti; Paralyfin Alpinam *Birds-eyn* dictam; Salicem folio laureo sive lato glabro odorato; Vaccinia nubis quæ copiosè collegi in monte *Hinckle haugh* propè *Settle*; Pneumonanthen, quæ in agro etiam Lincolnienfi abundat: Quatuor Musci clavati varietates, scil. Lycopodium, Sabinam Sylvestrem Tragi, seu Muscum clavatum foliis cupressis; Chamapeucen Turneri, seu muscum clavatum abietiformem, Muscum fortè terrestrem erectum *J. B.* & tandem Muscum partim erectum, partim repentem: Cirsium Britannicum repens *Clus J. B.* Ranunculum globosum: Sedum minimum flore albo: Mercurialem Sylv. *noli me tangere* dictam; Trachelium majus Belgarum, aliâsq; quæ in his partibus satîs frequentes sunt, alibi quod sciam in Angliâ nusquam proveniunt. Quamvis verò plantis indagandis hoc iter præcipuè destinaverim, alias tamen historiæ naturalis partes non omninò neglexi. In historiâ quidem Piscium nihil promovi: Avium vero 4 aut 5 species mihi oblatae sunt non antea visæ, nimirum Grygallus major Gesneri, quem Francolinum Itali vocant, in montibus ericosis frequens, *Red Moregame* Venatores & Rustici vocant. Non me latet Gesnerum Francolinum Italicorum Gallinam corylorum dictam existimare. Ego avem hanc eandem esse puto ei quam D. Thomas Crew Monspeliî pictam nobis ostendebat, cujus appellationem Gallicam oblitus sum. Merula Saxatilis seu montana, à Torquatâ dicta, (ut mihi videtur) omninò diversa; Merula aquatica & Caprimulgus; Avicularum quoq; duæ aut tres species, quæ nescio an, aut quibus nominibus descriptæ sunt. Vin' ut observationes meas de Insectis tibi communicem; quasi verò cæ diligentiam

tua

tuam effugissent. Age, nè me in hâc incultâ, fœcundissimâ tamen Philosophiæ naturalis parte nihil studiî aut operæ collocâsse existimes, non pigebit eas adscribere quamvis tibi fortasse notissimas: In summitate montis oppido Settle imminentis, *Apem sylvestrem* observavi, cujus alæ cinereæ ductu nigro transverso insignes fuere. Aliam præterea *Apem sylvestrem* ex Eulâ in lasano seu latrinâ generatam aculeo carentem, aliâs api domesticæ non absimilem. Est autem Eula hæc (seu Vermiculum mavis dicere) fordidè alba, oblonga, caudâ tenui productâ: duas insuper Apum sylvestrium species, quæ in parietibus antiquis ex luto compositis nidificant, in agro præcipuè *Northamptoniensi*. Verùm antequam apes dimittam, de Fucis tibi respondebo. Mihi equidem nullo meo experimento constat Mares eos esse. Verùm quoniam *Butlerus* aliiq; qui Apum historiam summâ cum diligentia tradiderunt, id asserant, nos quoq; receptæ sententiæ tantisper adhærendum censuimus, donec falsitatis convinceretur. Formicæ si eas irritaveris, (de majoribus *Horse Ants* dictis intellige) earum cumulos baculo agitando, liquorem quendam acetosum ejicient in baculum, qui naribus admotus eas vehementius ferit quàm acetum. Si iratam Formicam cuti admoveas eam rostello primùm perforat, deinde caudâ obversâ liquorem hunc orificio instillat, qui pruritum & dolorem excitat. Hujus rei experimentum ego nondum feci, ab amico tamen fide dignissimo accepi, nec de eâ dubito, præsertim cum liquorem dictum adeo acrem senserim. * * * *

Vale iv. Idus Septemb. 1668. i. e. Sept. 10.

Mr. Wray to Mr. Lister.

Joannes Wray D. Martino Lister S. D.

L Iteras tuas & novissimas & superiores accepi, quibus Araneorum 30 à te nuper observatorum nomenclaturas inseruisti. Miror sanè quâ arte & industriâ usus, tam brevi temporis spatio, tam angustis loci limitibus tot distinctas species investigare potueris: At verò satîs mirari nequeo, unde tibi tantum otii tam alieno tempore cum curis & sollicitudinibus variis perturbatus huc illuc fluctuaret animus, nec sui juris esset, ut possit cuiquam studio se totum impendere. Ego equidem (ut verum fatear) in Araneis inquirendis & contemplandis minùs diligens & industrius fui, partim quòd aliis studiis & negotiis impeditus iis attendere non vacaret; partim quoniam ob veneni suspicionem vix tractabiles sint hæ bestiolæ, mihi præsertim, qui ab ineunte ætate vulgari præjudicio abreptus, ab iis nonnihil etiamnum abhorream. Ast quamvis Araneorum historiæ parum peritus sim, duo tamen habeo, de quibus te consulendum censeo. Alterum occurrit (ni malè memini, nam liber ad manum non est) in Micrographiâ dictâ D. *Hook*, estq; historiola perquam lepida de areneâ venatrice & insidiatrice, quam à se visam autori communicavit D. *Evelyn*, vide sis librum ipsum, ego enim memoriæ meæ non satîs fido, ut eam referre auserim. Nunquid simile à te unquam observatum fuerit scire aveo; nam & tu quoq; in titulis ad me transmissis Araneæ saltatricis unius & alterius meministi. Alterum, ab amico fidè dignissimo mihi communicatum fuit, à se sæpius spectatum. Nimirum quòd Aranei nonnulli telas suas non extrahant tantum & eliciant ut moris est, sed protrudant & quasi projiciant ad distantiam notabilem, projiciunt inquam, i. e. prorsum ejaculantur obliquè, & ad latus, & non tantum demittunt rectà deorsum, nam & hoc ab aliis obser-

observatum nobis antea innotuit. Quomodo illud fieri possit, quum filum non rigidum sit baculi ad instar sed tenuissimum & ut puto molle, non satis perspicio. At ille nullus dubitavit se rem ipsam mihi brevi monstraturum, ut oculis saltem meis si minùs ipsius sermoni crederem, quod & effecisset, ni mihi occupato res memoriâ excidisset. Superest jam ut tu rem penitus conficias, & omnem mihi scrupulum eximas. Alia Insectorum genera non omninò neglexi *καλέομαι* & *ἀνέλυμαι* at verò cum Ds. *Willughby* iis conquirendis, examinandis, describendis, conferendis sedulam à multis retro annis navavit operam, ego obiter tantum & animi causâ hâc in parte versatus sum. Agè tu, procedas bonis avibus, habes quem æmuleris. Non deerit utriq; vestrûm materia in quâ ingenia exerceatis. Latissimus patet campus à nemine antea occupatus, nullius pede tritus. Naturæ divitiæ planè sunt inexhaustæ, nec cuiquam post mille secula nato deerit quod scrutetur, & in quo se cum laude exerceat. Hippocrati viro summo qui jamdudum in medicinâ principatum tenuit, detractum nollem, quem Spagyrici etiam mirantur, in primis Helmontius tuus, dum rarissimi doni virum & Adeptorum participem eum appellat. Libros *ἐπιδημιῶν* nunquam legi, nec alios quàm Aphorismorum, in quibus ego nonnulla observavi quæ mihi aut falsa aut cum ratione minùs conjuncta visa sunt. Verùm de his fortasse aliâ vice. D. *Wilkins* in episcopalem cathedram evectum, & sui ipsius, & mei, & præcipuè ecclesiæ causâ vehementer gaudeo: Me tamen per eum ecclesiæ restitutum iri, itante sententiâ, planè est impossibile, nec enim unquam adduci me posse puto ut declarationi subscribam quam lex non ita pridem lata presbyteris aliisq; ecclesiæ ministris injungit, nec tamen tanti est jactura mei qui nulli fere usui ecclesiæ futurus essem, utut (quod dici solet) rectus in curiâ starem. * * * *

Prid. Kal. ixbris Dabam Notleix. i. e. Oct. 31.

Mr. Lister to Mr. Wray.

M. L. D. Johanni Wray suo S. D.

QUOD tibi otium nostrum probavimus, vehementer gaudeo. At quid in me quæris præcipuam artem, cujus tu non & author & præmonstrator fueris! Aranearum nudi Tituli tibi arrisere: neque dubito, quin integræ earum historiæ magis placuissent, ita res planè novas observavimus. Sed librum mutilare nolui, in quo nomen tuum amicitiae nostræ ergo inscripseram, neq; in præsentia alia transcribam, quàm quæ à me quæris. Itaq; scito in Micrographiâ D. *Hook* duas Araneas nostras perstringi, quarum nomina habes, nimirum unam *Araneam rufam non cristatam*, &c. alteramq; de quâ quæris, *saltatricem cineream*, &c. atq; hâc etiam in nostrâ insulâ frequentissima est, apertoque Marte venatur solertissima bestiola, ejusq; venationis modum elegantissimis verissimisq; verbis enarravit D. *Evelyn* noster. Quod autem ego istam ejaculationem fili non ignoraveram, tibi abundè testetur Aranea volucris nostra, imò verò ferè omnes, quibus est materia ad fila remittenda, idem planè factitant: sed eâ præcipuè delectari videtur, quam ideo *volucrem* appellavi an quòd in eâ hanc rem primùm notavi. Ast ipsam rem à principio audi; profectò si mecum fuisses mense Septembri jucundissimo spectaculo te beâssem. Nam possis meminisse tum plures serenissimos dies continenter illuxisse, quales tu & ego toties admirati sumus in illâ felici Galliâ Narbonensi. Ego, inquam, tum temporis Araneas conquirendo, mirificas illas telas coelitus delapsas propius considerare volui, in quibus pertractandis fortè incidi in hanc Araneam, mihi nunquam antea visam. Hâc ego novitate mirè commotus, alias illico telas intercipio, aliasq; easdem Araneas itidem notavi. Atqui nè adhuc quidè suspicari potui, eam tot tantarumq; telarum authorem fuisse. Fortè

in diebus paucis dum attendo artificio aliarum mihi notissimarum Aranearum, subito ab instituto destitit ea quam contemplatus sum, atq; resupinata anum inventum dedit, filumq; ejaculata est quo planè modo robustissimus juvenis è distentissimâ vesicâ urinam. Miror inusitatum morem bestiolæ, videoq; jam filum in plures ulnas remissum fluctuansq; in aëre; mox verò infiluit ipsa bestiola, eoq; rapiebatur, quo ducebat filum ano etiamnum firmiter adhærens, supraq; non nimium humiles arbores evecta est. Ego lætus alias quæro, eandemq; rem mihi postea confirmârunt infinita penè experimenta. Atq; illud quoq; ab assiduâ observatione huc accedit, quod penè incredibile est, rem tamen planè conficit, nimirum dum ita volant, prioribus pedibus celerrimè circumactis, id omne longissimum filum ad se retrahunt, inq; glomerem aut floccos implicant, subinde nova ob vecturam fila sufficiens remittendoq;. Tantam ego nec jam copiam miror hujusmodi telarum, cum tot earum authores sint; nec modum fiendi, quem tibi satis, ut puto, exposui; nec materiam cum hæ telæ planè eadem sint quæ cæteræ domesticæ. Unum illud est de quo dubites, has telas paulo teneriores esse, at tu cogites velim calorem solis, & si ita minus credas, fac experimentum ad ignem an recens tela aut fortassè vetus macerata non in eandem planè albedinem teneritudinemq; coquatur. Sed de his hætenus: alia plura huc pertinentia, si rem fortassè jam minus illustraverim, tuq; ea desideres, libenter expediam communicaboq;. Cochleæ, quas superiori anno observaveram, spiris è dextrâ in sinistram tortis tibi visæ sunt res dignæ notitiâ vestri amplissimi collegii. Certè scio non parvi facies originem harum Telarum, de quibus quantas nugas apud scriptores etiam recentissimos! ut aliquando homines etiam naturæ liberæ, cum eam satis jam vexent, diligentèr attendant. Nam video somnia vulgò philosophantium jam diu plane exolescere. De Formicarum aculeo,

nihil

nihil mihi rescribis, cujus tamen, quod scio, nemo
hactenus vel levissimam mentionem fecit. * * * *

Mr. Jessop to Mr. Wray.

S I R,

I Have done the most Part of that you enjoin'd me. I have stuffed the Skins of a *Moore-cock* and *Moore-hen*: I have gotten a black-legged *Linnet*, and gathered a few of the *Vaccinia Rubra*; but cannot separate the Seeds, as you directed: As they are I shall send them you. I have procured the Skin of a great Bird, which he that gave it me call'd a *Scarfe*; but I believe it will prove a *Bernicle*. The Description of it I sent to Mr. *Willughby*. I have gather'd some Words and Proverbs which I believe you have not yet met with; and received from Mr. *Fisher* an Account of the *Hauke Butterfly*. I shall send you all when I know which way I may do it safely. *Richard Wright* is come from *London*, and hath done little there; only the Judge hath advis'd him to indite the Man and the Maid, if *Stephen* trouble him any more. This only is observable, which I was not acquainted with when you was with us, that *Kurlew*, the Foreman of the Jury, who, the Spirit saith, was bribed by *Stones*, died raving mad within three Days after he had pass'd his Verdict, crying out, that *he saw the Devil*, and such-like Expressions. This is very true, for I had it from one who was at his Burial. The Coroner also hath lingered away ever since the Assizes, and died about the Time that *Wright* went to *London*. The Maid at *Overbaddon* still liveth, and eateth nothing. She hath been watched twice for fear of Imposture; once by the Directions of a Physician who lives thereabouts: And for about a Fortnight
since

since, by my Lord *Devonshire's* Order, who sent his own Servants by turns.

Having lately perused, amongst the Philosophical Transactions, my Lord *Brounkers* Quadrature of the Hyperbole, which pretends to have done it only as near as you please; and reflecting upon some things that I had formerly consider'd, I grew almost confident that it might be done truly and Geometrically by one that would go to work with it the right Way. I am not so foolish as to think, that I who pretend not to be skilled so much as in the Elements of Conic's, can add any thing unto what they have done in their own Way, in which they have been so long conversant. Yet, in my first Entrance, there was one thing came into my mind, which all those who have written upon this Subject have either not taken notice of, or neglected, which will go a great way in the Business: And that is this.

Si dati sint duo coni Ifofceles ejusdem altitudinis, axem habentes communem, & secantur hi coni à plano axi parallelo, possibile est exhibere Quadratum, quod eandem habebit rationem ad spatium interceptum inter lineam hyperbolicam, quæ est in superficie majoris coni, & lineam hyperbolicam quæ est in superficie minoris coni ita secti, quam habeat linea hyperbolica minoris ad lineam hyperbolicam majoris coni, addita linea hyperbolica minoris coni.

If you think this worth your Consideration, I shall send you the Demonstration at a more convenient Time.

I am

Broomhall, Nov.
25. 1668.

Your affectionate
Friend and Servant,

Fra. Jessop.

Mr.

Mr. Wray to Mr. Lister.

Joannes Wray D. Martino Lister suo S. D.

QUOD partem aliquam lucubrationum tuarum mihi inscribere destinaveris, plurimum me tibi debere agnosco, proq; tam insigni tuâ voluntatē & propenso in me animo gratias quas possum maximas refero lubens meritò. Interim tamen monendus es, ne dum affectui nimium indulgeas minùs prudenter agas: Quin potius, dum integra adhuc res est, deligas tibi Patronum aliquem ex antesignanis illis, magnis literarum luminibus, unde & operi tuo aliquid dignitatis & tibi ipsi fructûs accedere possit. Ego enim ut qui tenuitatis meæ nimis conscius sum, haud equidem tali me dignor honore. Quod ad quæsitâ mea tam cumulatè & perspicuè respondisti, addito insuper corollario, de filis illis longissimis in aëre volitantibus, quæ tantopere stupet Philosophantium vulgus, quorumq; ineptas nescio quas & ridiculas causas fingit, pergratum habeo. Ego verò de hisce quoq; te consuluissem superiore epistolâ ni è memoriâ excidisset, quamvis & ipse Araneorum ea opus esse nunquam dubitaverim. Sanè omnia hæc tibi explorata & prospecta fuisse ex ipsismet specierum titulis antea conjectabam. Et has & superiores tuas observationes dignissimas censeo quæ Soc. Reg. communicentur, quod & faciam tuo nomine tuisq; verbis si tibi ita visum fuerit. Quamvis, ut nihil dissimulem, ex quo huc veni, dum Philosophicas transactiones, quas vocant, lectito mense octobri editas, literis ex insulâ *Bermudensi* ad societatem scriptis simile quiddam observatum animadverto: quod tamen in tantâ Telarum & Araneorum magnitudine nemini non obvium & factu facillimum fuit. Scribit enim *Bermudensis* ille telas eas adeò crassas & validas esse, ut vel Turdis irretiendis sufficiant. Superest ut tibi aperiam, me jam in sylloge Proverbiorum Anglicanorum (quam olim

olim meditatus adagia undique tum ex familiarium colloquiis & ore vulgi, tum ex libris editis conquiſiveram) ordinanda & adornanda totum eſſe; eamq; brevi cum commentariolis in lucem emittere ni quid vetas, cogitare. Tu verò orandus es ut ſymbolum tuum conferas, & ſiqua minùs vulgaria & non inveniſta adagia obſervaveris, aliquando ea nobis communicare non graveris. Formicarum nulla à me facta mentio, quoniam nihil certi haberem quod ſcriberem. An Aculeum habeant nec ne, fateor mihi nondum experienciâ conſtare: nec enim periculum feci deſes & negligens cùm mihi promptiſſimum fuit. Tu cùm id mihi perſuadere conaris argumentis potiùs contendis quam ad αὐλοψίαν provocas. Ds. *Willughby* affirmat in minoribus formicis (nam majores in hâc viciniâ nullæ) ſibi quæſitum, non viſum tamen Aculeum an fortè oculorum vitio? Nam famulus, cujus miniſterio uſus eſt, aſſeſſe aſſerit. Ego verò expertus ſum Formicas illas majusculas quas noſtrates *Horſe-ants* vocant, ſi illarum cumuloſ baculo aliquandiu agitaveris liquorem quendam acerrimum in baculum excernere aceto deſtillato non longè diſſimilem, niſi quòd nares vehementius feriat. Cujus experimenti Dr. *Fiſher* me primùm comonefecit cum *Sheffeldiâ* eſſem, qui & aſſeruit è formicis illis in cucurbitam conjeſtis ſe liquorem ejusmodi deſtillando elicuiſſe. Episcopum *Ceſtrienſem* hîc propediem expectamus, namq; nos in tranſitu ſe inviſurum promiſit. Verùm illius adventus hoc temporis articulo mihi non uſq; quaq; gratus, quoniam ſubvêreor nè Verſionem libri ſui vehementiùs urgeat, ego autem aliàs occupatiſſimus, tot ſimul negotiis vix ſufficio. * * * *

Dabam Mediæ villæ viii^{vo}. Id. Decemb. 1668. i. e. Decemb. 6.

*Mr. Lister to Mr. Wray, in Answer to
the foregoing Letter.*

M. L. D. J. Wray suo S. D.

NON est quod tibi pergam ampliùs molestum esse de *Araneis*; nisi quòd ipse jam proximè perlegeram epistolam illius Bermudensis, ubi factum quidem enarrat, sed fiendi modum ridiculum exposuit; nimirum fila ab iis exspui, ac si ex ore Araneorum & non ex ipso ano ejacularentur: deinde istam ejaculationem, quod observavi, *Araneis* minimè usui esse in *Reticulis* pertexendis, non autem ad funes eorum suspensorios adfigendos. Sed de his aliàs plura & exactiùs; interim unum addam, quod superioribus literis omisi, me compertum habere *Araneas volatum exercere*, non solùm ob oblectationem, sed etiam ut *Culices* aliàsque bestiolas capiant, quorum incredibili vi àër circa autumnum repletur. Istam quidem venationem mirificam esse oporteat, sed ea adhuc non satìs mihi innotescit: hujus tantùm benè memini in istis *Telis* longissimis me membra *Culicum*, alas putà pedesque &c. decerptos sæpiùs animadvertisse, non aliter quàm in earum cubilibus & plagis. Quod ad *Formicarum aculeos* pertinet, oculis meis certam fidem habeo, eos quotiescunque id tentare libuit (tentavi autem sæpe) visos fuisse, nec nimium breves in minoribus, tum rufis, tum nigricantibus non alatis. Nam *Majores* *ἰπποκύρηνες*, in nostrâ insulâ adhuc non observavi, in quibus tamen ii poterint esse magis conspicui. Sed jam suspicor ex proximâ inquisitione *D. Willughby*, eos posse deesse in aliquibus, si ut desunt alæ, atque in his fortassè sexûs discrimen aliàs videbimus. Cùm verò sermonem facimus de *Aculeis*, ego penè persuasum habeo, eos non deesse etiam *Bufonibus* & *Lacertis* nostris, imò verò in singulis tuberculis (quæ quot sint bene nôsti in rugosis cuticulis

cuticulis harum bestiolarum) singulos aut plures aculeos abscondi, & pro arbitrio exeri. Sed hæc tantum mea conjectura, cum experimenta quæ de iis meditor jam commodè exequi non potero. Illud verissimum est, tum Bufones tum Lacertas vexatas lactei cujusdam liquoris guttulas undiq; emitte; nec cur ita id faciant video, nisi subsint stimuli ad vulnus infligendum, quo tantum eas nocere arbitror. Huc accedit ob similem rationem, quod nec te nec D. *Willughby* latet, inter Vermiculos è quibusproximâ foeturâ fiunt Scarabæi, unum genus reperiri passim in sylvis admodum virosi atq; ingrati odoris depascens folia Populi albæ : hunc, inquam, Vermiculum, si laceffiveris, statim exerit duplicem ordinem Stimulorum insignium, qui antea aut ex plano erant cum superiore parte corporis, aut certè velut parva tubercula paululum eminentes : in summis autem apicibus stimulorum stant singulæ guttulæ lacteæ : si bestiolam vexare paulisper mittas, protinùs subsidunt & guttulæ & stimuli, idq; toties experiri licet, quoties animalculum vexaveris. Plura possem adjicere in hanc rem, estq; tum copiosissima tum jucundissima contemplatio de Telis, quibus animalia & inferunt & propellunt injurias : sed ampliùs nec pagina nec epistolæ modus patitur. Vale xiv Calend. Januarias. [1664. ut opinor.]

Mr. Wray to Mr. Lister at St. John's.

J. Wray D. Martino Lister S. D.

NOS hic nuper *Arbores* nonnullas, Betulam v. g. Acer majus Sycomorum vulgò dictum, Alnum, Fraxinum, Corylum & Castaneam vulneravimus, ut indè succos colligeremus. In aliis expectationi nostræ eventus non respondit, at in Betulâ & Acere majore etiam superavit, siquidem medio Februario, incisione

factâ liquor nutritius ubertim extillabat, diu noctûq; absq; ullâ intermissione, non obstante frigoris post subsecuti vehementiâ; etiam cùm succus statim post egressum suum è vulnere in stirias concrederet, antequam in vas ei excipiendo subjectum defluere posset, donec tandem in ipsis pororum osculis congelascens ea penitus obstrueret. Sed & tunc quoq; Arbor interdium denuò lacrymare cœpit quamprimùm sol glaciem dissolverat, & occlusos pororum meatus referârat. Absq; intermissione dico, non tamen omnino sine remissione; frigus enim fluxum inhibebat, quamvis non omnino sisteret, unde tempestate calidâ copiosius quàm frigidâ, & interdium quàm internoctu ob eandem rationem destillabat. Tu si modò otium, animus, & facultas fuerit, eadem & his similia experiaris rogo, non tantùm in modò memoratis, sed in aliis quibuscunq; Arboribus, ut collatis postea experimentis, vel novis à te factis erudiamur, vel concurrentibus confirmemur, vel contrariis convincamur. Nec enim verisimile est pariter utrisq; successurum, aut utrosq; eadem observaturos, quin alteri inter experiendum obvenient vel succurrent plurima, quæ alteri vel nunquam contigerint, vel in mentem nunquam venerint. Verùm aliàs de his plura, cùm reliqua quæ nobismetipsis experienda proponimus absolverimus. Superest ut tibi gratias agamus, (Ego & *D. Willughby*) quod nos insigni errore liberâsti. Cùm enim olim Gallinagines minores *Snipes* vulgò dictas, & minimas tibi *Gids*, Nobis *Jack-Snipes* titulo cognitatas pro unâ & eâdem specie habuerimus, & sexu tantùm differre credidimus, partim vulgari præjudicio abrepti, partim quòd fortè fortunâ nobis oblari sunt in hoc genere duo aut tres Mares, in illo totidem Fœminæ; occasione tuarum literarum exactiore scrutinio factò, in utroq; genere tum Mares tum Fœminas observavimus.

Dabam Media Villa 3 Non. Mart. 1668. i. e. 13 Mar.

Mr.

Mr. Lister in Answer to Mr. Wray.

M. L. D. J. Wray suo S. D.

DE *Bufonibus* hoc addo, mihi compertum esse, non sine insigni periculo, eos laceffitos posse longè ejaculari istum liquorem lacteum, de quo ad te antea scripsi, & præcipuè, de dorso, cervice &c. minimè de ore, aut ano. Rem tamen summâ cautione urgeo, earumq; bestiarum genus in species aliquot diduxi. * * * *

Idibus Martiis 1668.

Mr. Wray to Mr. Lister.

Jo. Wray D. Martino Lister suo S. D.

DUM Cestriæ hæsimus, fortè fortunâ allatus est ad urbem *Delphinus* antiquorum, nostratibus *Porpessæ* dictus, à piscatore quodam in vado captus, à quo eum modico pretio emimus. Erat autem piscis mediocris, longitudine unius ulnæ, non squamosus. In fronte fistulam habuit, quâ & respirare potuit & aquam rejectare: tres duntaxat pinnas, in medio dorso unam, in ventre geminas, non procul à branchiarum loco, nam branchiis caret. Singulare est, in hoc pisce cauda ad corporis planum transversa, i. e. horizonti parallela & non perpendicularis, ut in aliis omnibus quos mihi hætenus videre contigit; nam è genere Cetaceo nullus antea mihi conspectus. Cerebrum ei & Cerebellum amplissima, piâ & durâ matre instructa, cranio osseo inclusa, & Quadrupedum cerebris demptâ figurâ externâ, (quæ in hoc latior erat nec adeò producta quàm in illis) persimilia. Quin & Asperam arteriam & Pulmones habuit Quadrupedum more,

more, qui folle inflati intumescebant, colorémq; & speciem Bovinorum Caninorúmve omnino exhibebant. Cor gemino ventriculo instructum, cum eodem Valvularum tricuspidum & semilunarium apparatu. Diaphragma musculosum. Hepar vel non omnino vel modicè in duos lobos divisum. Ventriculus membranofus duplex. Intestina Mesenterio annexa longissima 48 pedum mensuram implebant. Tenuium & crassorum distinctio nulla, nullum Intestinum cæcum, nullum Omentum, nulla Cystis fellea. Pancreas amplum manifesto ductu Intestinum perforat. Renes magni ad Bovinos accedentes, ex plurimis Granulis seu Glandibus conglomerati, plani & non gibbosi, aut interiore parte concavi, Ureteres ab inferiore extremitate egrediuntur. Vesica urinaria pro piscis mole exigua. Penis longus, tenuis, in vaginam reductus latitat ut bovinus: Testes intra cavitatem abdominis, longiusculi, suis vasis præparantibus & deferentibus instructi. In summâ, partium omnium interiorum structura ad quadrupedes proximè accedit: nec puto eum sinè Respiratione per quadrantem unius horæ durare posse. Coit, generat, & educat Fœtus ut Quadrupeda. Quin & Cerebri moles (quæ pro corporis ratione huic major est quàm plerisq; quadrupedibus) sagacissimum esse arguit hoc animal, unde fortasse fabulosa non fuerint quæ à veteribus de ejus ingenio & mansuetudine literis prodita sunt. Astantium turba, curiosè omnia rimari & accuratam anatomen instituere, nos non permisit. Alia tamen plura observavimus, quæ nè epistolæ modum nimis excedam, prætereo. Unum adjiciam. Totum corpus copiosâ & densâ pinguedine, (piscatores *Blubber* vocant) duorum plus minus digitorum crassitie undiq; integebatur, immediatè sub cute & supra carnem musculosam sitâ ut in Porcis; ob quam rationem, & quòd porcorum grunnitum quadratenus imitetur, *Porpesse*; i. e. Porcum piscem dictum eum existimo. Sed de *Delphino* hâc vice plus satis. Vidimus insuper Cestriæ Fæminam cornigeram,

ram, cujus ad te famam jampridè pervenisse puto. Si Masculum cornutum ibi vidissemus, res non adeò mira fuisset. Præterea *Encrasicholos* pisces, seu *Anchovas* non procul inde in mari captos vidimus. Superest ut tibi aperiàm, & in sinum tuum effundam quod me non leviter pupugit. Pudet pigetq; Tabularum istarum Botanicarum, in quibus conficiendis se operâ meâ usum esse prodidit Episcopus Cestriensis. Plurimùm interfuisset famæ meæ eas aut nunquam fuisse editas, aut saltem suppresso nomine: sunt enim confusæ & errorum plenissimæ. Tu quia nondum penitiùs eas introspexeris idèò non damnas. Dr. *Morison* in opusculo nuper edito, cui Præludia Botanica titulum fecit, illas, illarúmque tacito nomine autorem, an pro meritis an indignis modis excepit, aliorum judicium esto. Nec tamen mirum Tabulas confusas, erroneas & imperfectas esse, cùm trium tantùm hebdomadam opus fuerint, ego verò nihil antea ejusmodi destinaveram, nec de eo unquam cogitaveram. Præterea in iis ordinandis coactus sum non naturæ ductum sequi, sed ad Autoris methodum præscriptam Plantas accommodare, quæ exegit ut Herbas in tres Turmas seu tria Genera quamproximè æqualia distribuerem, singulas deinde Turmas in novem Differentias illi dictas h. e. Genera Subalterna dividerem, ità tamen ut singulis Differentiis Subordinatæ Plantæ certum numerum non excederent: tandem ut Plantas unà binas copularem seu in paria disponerem. Quæ jam spes est methodum hanc absolutam fore & non potiùs imperfectissimam & absurdam? qualem eam ipse libentè & ingenuè agnosco, non tam existimationi meæ quàm veritati studeo. Utcunq; tamen Autorem illum meritò contemno, qui quamvis adeò insons sit, ut nec latinè scribere nòrit, tam putidè tamen sibi adulatur, & stolidè superbit, ut viros millecuplo se doctiores contemnat, & iniquè secum actum putet, quòd non jampridem in Cathedram Professoriam evectus sit. Dum verò Societatem Regiam ineptissimè sugillat, se-
ipsum

ipsum fanis omnibus & cordatis viris deridendum propinat. Sed hæc mitto. De *Bufonibus* mira narras, & quæ ego alio autore vix credidissem. Observationes tuæ in tuto sunt, & societati jampridem communicatæ, quæ earum auctori ignoto quamvis gratias agi jussit. Vale.

Dabam Middletoni Nonis Maii 1669. i. e. Maii 7.

In a Latin Letter of Sir Philip Skippon's to Mr. Wray of June 1669, I find this, viz.

AD Luddi pottam nuper erat effossum antiquum monumentum hæc inscriptione.

D M
VIVIO MARCI
ANO 7 LEG. II.
AVG IANVARIA
MARINA CONIVNX
PIENTISIMA POSV
IT ME MORIAM

In eodem lapide est figura Militis.

Mr. Wray to Mr. Lister at Nottingham.

Dear Sir,

Middleton Novemb. 15. 1669.

HAVING now receiv'd a second Letter from you in *English*, I look upon my self as licensed to answer you in your own Language. I am extremely obliged to you for the Catalogue of Plants you sent enclosed, they coming very opportunely, now that I am (chiefly by your Intigation and Encouragement

ment) revising and preparing for the Press my general Catalogue of *English* Plants, which I hope to finish and get published by the next Spring. I shall go over all yours, and give you an Account which are to me unknown, and which I have not yet met withal in *England*.

Muscus Denticulatus major Park. which you say grows plentifully in Springs, it was never yet my Fortune to find in *England*.

Muscus Corniculatus Park. is frequent with us hereabouts, and with the like Scarlet Tops.

Muscus Clavatus, *sive* *Lycopodium*, grows (as you well observe) on all the *Moors* in *Yorkshire*, *Derbyshire*, &c. plentifully, and on *Hamstead-Heath*, near *London*.

Muscus Clavatus Cupressiformis Park. or *Sabina Sylvestris* Trag. I have observed plentifully on *Ingleborough-Hill*, and also on *Caderidris* and *Snowdon Hills* in *Wales*.

Your Moss, like the Pine-tree, I suppose is the same which I call *Muscus erectus abietiformis*, and have found on many of the *Moors*.

Tilia Fœmina is a Tree very common in *Essex*, and many other Counties of *England*: I mean the *Fœmina minor* of Park. for the *major* I have not as yet seen any where with us spontaneous. I know not what to make of the *Tilia Mas*, but suspect it to be all one with the *Carpinus*, or Horn-Beam.

Ornus, *sive* *Fraxinus* Sylv. Park. is common also hereabouts, though ineptly so called.

Erica Baccifera Nigra Park. I have also with you observed plentifully on all the *Moors*. It grows also on a Heath within a Mile of this Place.

The other two Sorts of *Erica* you mention, are frequent on all the Heaths of *England*.

Scorodonia also is a Plant most common in the Woods in almost all Parts of *England*, excepting *Cambridgeshire*.

Sonchus Lævis alter parvis Floribus, is no rare one; and two years since I found it within a mile of Cambridge.

Hieracium rectum rigidum, quibusdam Sabaudum J. B. & *Hierac. Fruticosum Angustifolium majus* Park. I do not distinguish, but make the same; and therefore desire you to tell wherein you put the Difference. The Plant I have observed in many sandy and some rocky Grounds.

Your *Thlaspi Fruticosum Leucoii* an *Globulariæ Folio latissimo*, is, for ought I know, a *non descript*. I desire, if you have any of it dried, to send me a Branch. I look upon it as a great Discovery, if it be not *Camelina* Ger.

Pyrola vulgaris nostras I have found in many Places in the North.

I am much to seek what your *Leucoium*, or *Hesperis*, with a very broad Leaf, should be, unless perchance *Bursæ pastoris loculo oblongo affinis pulchra planta* J. B. which I have found in Craven.

Lychnis Sylvestris flore purpureo, is a Plant every where very common, and doubtless may be found in Cambridgeshire; though omitted in the Catalogue.

The Knoutberry I have found on all those Hills you mention, but with the Fruit only on *Hinckell-boe*.

Raspberry is also frequent on the Mountains both in Wales and in the North.

Mentastrum, &c. Park. I have seen growing wild in one or two Places.

Capilli Veneris veri similes I desire to see a Leaf of, if you have it dried. I guess it to be that which I have styled *Filix Saxatilis caule tenui fragili*.

Trachelium majus Belgarum in the mountainous Parts of Derbyshire and Yorkshire, &c. is very common in the Hedges and Thickets.

Digitalis purpurea is every where to be found in sandy and rocky Grounds.

Anagallis

Anagallis lutea nemorum is no less common in the Woods.

Alchimilla vulgaris grows not only in all Mountainous Meadows and Pastures, but also plentifully in the Meadows hereabouts.

Turritis vulgator is, notwithstanding its Name, no ordinary Plant with us.

Rhamnus primus Diosc. I myself have not seen in England; but by Dr. Mapletoft was informed, that it grew wild on the Sea-Coast of *Lincolnshire*, which you now confirm.

The low sort of *Salix* you mention, I take to be the *Salix Angustifolia repens* of Park. which I have seen wild in many Places, but not in *Cambridgeshire*.

You have been more fortunate than I in finding *Valeriana Græca*, which I have sought in vain among *Fournesse Fells*, where I was informed by T. Willisell that it grew wild.

Solanum lignosum flo. albo may, for ought I see, be a new Species.

Lathyrus sylvestris lignosior Park. is to be found in the Woods in most Counties of England, except those Midland Clay Grounds in *Cambridgeshire*, *Bedfordshire*, &c.

Your small *Lathyrus*, with a pale yellowish Flower, is to me unknown, and I believe a *non descript*.

Vaccinia nigra vulgaris few Counties of England want. The *Palustria Thymi Foliis* are more rare, though hereabouts we have them in great Plenty.

The Rose with the large prickly Fruit I take to be the *Rosa sylvestris pomifera major* Park. which I have observed in many Places of *Yorkshire*.

Alsine aquatica folio oblongo is a Stranger to few Places.

Phalangium nescio cujus, is it not *Pseudoasphodelus Lancastrensis*? which is common in boggy Places in the North and West of England.

Geranium muscum olens I have found, yet never but once, wild in *England* that I remember.

Bistorta, &c. I have seen in the Meadows about us here.

Crocus Autumnalis pratensis, unless you mean *Colchicum* (which in the West Parts of *England* I have observed plentifully growing wild) I know not.

Raphanus Rusticanus I never met with in the Fields or Meadows, where I could be assured it came spontaneously.

So, Sir, I have dispatch'd your Catalogue, and you may well wish that my Letter too were dispatch'd; but I have from Mr. *Willughby* a Business of private Concernment. I could wish you would take the Pains to revise my Catalogue of Plants before it goes to the Press. If you will do me that Kindness, I will send the Copy over to you the next Opportunity.

Sir,

Your very affectionate Friend,
and humble Servant,

John Wray.

Mr. Wray to Mr. Lister.

S I R,

Middleton Decemb. 10. 1669.

I Have perused the dried Plants you sent me, and, according to my best Judgment, added Names to such as wanted, and do now with Thanks return you them back again. The Plant you judged to be a *Thlaspi*, is nothing else but *Glastum*; and that which you titled *Lotus*, is *Fumaria alba claviculata*. Your
Hesperis

Hesperis is to me altogether new, never before seen in *England*, or elsewhere: Whether it be by me rightly referred, you are better able to judge, who have seen the Plant growing, and its Flower in Perfection. The *Mentastrium* I have found growing wild plentifully about *Florence*, but never in *England*. That which you style *Capillo Veneris vero similis*, I make to be a sort of *Adiantum aureum*. I have often in moist Places found straggling Branches of such Leaves at the Roots of *Adiantum aureum minus*, but never growing so many and thick together from the same Root, all of the same kind, but once, and in such a Place as yours was now found. That you may be convinc'd, that the *Muscus* you styled *Denticulatus major*, is not that so named by *Herbarists*, I have, out of Mr. *Willughby's* Store, sent you two Branches of the *Muscus denticulatus major*, which I must entreat you to return again, at least one of them. We have made bold to take part of such of your Plants as we wanted, where you might well spare it. If you have any Sorts of *Mushrooms* specifically distinct from those I have inserted, and of whose Names you are sure; I should be glad of them, and willingly afford them Room. Such of your Grasses as I have not put Names to I am as yet doubtful of. The Roses you mention I am well acquainted with; the lesser, being the *Pimpernell* Rose of *Gerard*, you will find something of in my Catalogue, which I herewithal send you, entreating you to read it over so soon as your Leisure will permit, to correct, as you shall see Cause, and to send me your Animadversions and Remarks upon it, and such additional Observations of your own as I have omitted. I should be glad to know whether you have observed and considered the small *Caryophyllus* growing near *Nottingham*, (as I take it about the Gallows) because *Th. Willisell* would persuade me that it is distinct from that found about sandy, and several other Places of *England*. I once
saw

saw it, but did not take exact Notice of it; and whether you have heeded the *Polemonium Petræum Gesneri*, which he brought us from *Nottingham* Castle Walls. Many things there are in this Catalogue which I have not sufficiently cleared; however, I am resolved now to huddle it out, and get my Hands rid of it. One thing I must not omit to tell you, that I have robb'd you of the Credit those Observations you communicated to the Society have gain'd in Foreign Parts, by letting my Name stand before them, and suffering yours to be suppressed; for I hear they are attributed to me: Whereas I never had either the Wit to find out, or the good Fortune to hit upon any so considerable and unobvious Experiments. Proceed in your ingenious Studies and Enquiries, for methinks Providence doth seem remarkably to succeed your Endeavours, and communicate somewhat of your Discoveries from time to time to,

Sir,

*Your very affectionate Friend,
and humble Servant.*

John Wray.

Mr. Lister to Mr. Wray.

My dear Friend,

Friday,

I AM glad to hear you commend *Salmasius*; I never yet read the Preface, but you speak judiciously of the Work: I remember you once took away the Prejudice I had against *Pliny*, and I have ever since look'd upon him as a great Treasure of Learning.
I could

I could wish that you would give us your Thoughts too of both the Ancient and Modern Historians, and add this to your Preface. I remember my Lord *Bacon* rashly censures all, and rejects the whole Design as supervacaneous ; but yet methinks, not without some Contradiction to his own Principles ; for if a particular Nature or Phænomenon may be in some particular Body more bare and obvious, without doubt the greater Number we have of particular Histories, the plentifulter and clearer Light we may expect from them. For my part, I think it absolutely necessary, that an exact and minute distinction of things precede our Learning by particular Experiments, what different Parts each Body or Thing may consist of ; likewise concerning the best and most convenient ways of separation of those Parts, and their Virtues and Force upon human Bodies, as to the Uses of Life ; all these, besides the different Textures, are things subsequent to Natural History, unless you make the last Assistant, as indeed all the rest are, were they truly known ; but I am too bold to venture thus much, before my Master, and I hope you will now soon let the World know they have too long neglected what you can teach them to prize. Another time we will, if you please, talk of the Advantage *England* has in being an Island, to set a Copy of this Nature to the rest of the World, and to set forth exactly what she has of her own. I am but a learner, and a very young one in Minerals, but I am pretty confident that it is *yellow Amber* they find not un plentifully after great Storms on *Lindsey* Coast. I have near *lib. i.* by me that I bought of the poor Fishermen's Wives at *Theedle Thorpe* ; some Pieces of it are transparent and of a dark yellow ; others alike transparent, but of a brighter yellow ; others again are of a pale yellow and troubled, as though they were fattish : likewise of the Jet, *i. e.* the great Pieces and Grove, *i. e.* the small Dust, I have of both by me, and I doe think them not *Channel* because
they

they burn with much Difficulty, and not kindled but on Wind Hearths as I may call them, being the Country People that use of it have Fire Hearths made on purpose for that Fuel, that have Holes under them which are pierced thro' the Foundation of their Houses; whence an unmannerly Proverb is used among them, *Neighbour, is the Wind in your Hole this Morning?* That is, have you the Conveniency of keeping in Fire to Day; else it grimes not, is light, and many Pieces if rubb'd will draw Straws; if I have an Opportunity I will send you of the one and of the other, and also the *Legs* of the *Buzzard*, for that's all I have of it by me; but upon comparing them with the Kite, the Bald Buzzard, and Wood Buzzard, you'll find them exceedingly different: But Mr. *Willoughby* did almost persuade me it was the *Milvus æruginosus*. *Aldr.* for indeed it is of a self Colour, that is, all over of one rusty Colour just like the rust of Iron, as you may guess by what Feathers yet stick to the Knees. You'll be pleas'd, at your best Leisure, to send me an account of the Authors that have written of Minerals and Fossils, for I am, as I said, but a beginner in this Part of Natural History, and I have great Encouragement, besides my Profession, not to be ignorant in this Part especially, having great hopes of considerable Mines in my own Lordship in *Craven*; therefore I would furnish my self with the best Authors.

I had written almost hitherto when Mr. *Willoughby's* Keeper brought me the happy Piece I so long desired to see; I read it over forthwith greedily, and am extremely pleased that you have added the particular Uses to the Titles. I have no Additions to make you an Offer of, only I read it not without Pen Ink and Paper by me, on which I now and then scrawled something, and have taken the boldness to send it you.

Mr.

Mr. *Willughby* was, as it were, desirous to know something farther of me concerning my History of *Spiders*: The whole is yet unperfect; but, however, I have transcribed the Tables, that he may for the future join with me, and assist me in the Prosecution of my Design; as to this Part of the History of Insects: For, for the other Parts, I must neglect them in a manner; but this will still be my particular Ambition, to look after with Care. He may freely command my Papers at any Time; and when you have corrected the Style, (for there must be Faults in it) if you think fit, make him a Present of it in my Name; or otherwise, make use of it as to your Tables now in hand.

I thank you for the Pains you took to note my Plants, and to name them; it is a great Satisfaction to me. I have, in Acknowledgment, sent you the Things mentioned in this Letter, *viz.* of our *Amber* and *Jet*. One thing I must add, that you may not think that this is casually cast upon the Shore, for it is the constant Effect, more or less, of Winter Storms; and the poor drive a kind of a small Trade with it, the Apothecaries and others buying it of them at about 3*d.* an Ounce. Also I send a Leg of the *Busfard*, a preserved Medler: To these I add, by way of Present, a couple of Pastills, or small Cakes of the Juices dried in the Sun, of our *English* Store of Plants; they are unmix'd, and purely natural, as they were taken from the Plants by Incision: The one was in the drawing or issuing out of the Plant a Purple Juice; the other of a Gold Colour: The one burns freely with a Flame, and is of no offensive or ungrateful Smell; the other burns not at all with a Flame, at least continues it not, and is intoxicating: They are both bitter. Guess me the Plants that afford them, *Et eris mihi, ut revera es, magnus Apollo*. I have a Score of different Juices besides by me in Cakes; but these are (if I mistake not, at least to the

I

best

best of my Knowledge) no where made Mention of by any Author, altho' the Plants be common in *England*. They are the Juices of no Fruit, but of the Body of the Plant.

Dec. 22. 1669.

Mr. Wray to Mr. Lister.

Dear SIR,

I Return you most hearty Thanks for the Pains you took in perusing my Catalogue, and for your Animadversions and Observations thereupon. Your Opinion grounded upon Experience, that *Opium* and all *Opiates* are highly venereal, if taken moderately, I willingly embrace. The Reason which induced me to subscribe to the common Opinion, was not because I imagined them to be cold, as the former Physicians fondly conceited, but because they do in a large Dose fix the Spirits, and inhibit their Motion; as appears in that they are Anodynous and Soporiferous; and the Sperm being a spirituous Body, I was thence induced to think that they might hinder its Turgescency. But, upon farther Consideration and Enquiry, I find the Effects of *Opium* to be something analogous to those of Wine, and other generous Liquors; which, moderately drunk, incite to Venery, but to Excess, become soporiferous and narcotick, extinguishing that Appetite: Whence it is supposed to proceed, that the *Germans* are of all Nations most continent, and least addicted to Women. I thank you likewise for your Note out of *Olearius* concerning *Hemp*, which I have now entred. I intend to follow your Advice, in adding something to my Preface concerning the Usefulness of being particular
and

and exact in Natural History: But much I have not to say concerning that Point; and I am fearful of enlarging my Book, and swelling it to a greater Bulk than may commodiously be carried about in ones Pocket, for that will make it unuseful, and consequently less saleable; besides that, it is not proper to set a great Porch before a small House. I must not forget to thank you for the Present you sent me. I agree with you, that what you sent in small Pieces, and consequently the rest of the same Nature cast up on your Coast of *Lindsey*, is *Yellow Amber*. The like Variety of Colours is observed in it where-ever it is found; and the other great Piece is truly Jet, and not Cannell. By the Leg of the Buzzard, and the Description you formerly sent me, I am confidently persuaded it is the *Milvus Æruginosus Aldrov.* As for the Authors who have written of Minerals and Fossils, I have not been so conversant in that Part of Learning as to be able to give any Judgment concerning them. *Georgius Agricola de re Metallica, & de Naturâ Fossilium*, is of all Men approved, though I must confess my self never to have read him; and I suppose *Lazarus Erker*, a German, is a good Writer on that Subject. I have run over *Kircher's Mundus Subterraneus*, though I must needs say I was not much improved by it; yet some Use may be made of it. Some Help it hath been to me to have seen various Collections of Minerals with their several Titles in Cabinets beyond the Seas. I am not so cunning as to tell, or give any probable Guess, what those Plants should be whose Juices you sent: Indeed I do not pretend to a critical Palate, but I must desire to be informed by you. Of your Table of Spiders I shall at present add nothing. I doubt not but it will be of great Use to me, when I shall have Leisure to prosecute that Enquiry. Since I received my Catalogue from your Hands, I have procured some considerable Experiments and Observations medical from Dr. *Need-*

ham, and some other ingenious Physicians of my Acquaintance ; so that I have not yet sent it to be printed.

Middleton, Feb. 13. 1669.

*Mr. Lister at Craven to Mr. Wray at
Middleton-Hall.*

My Dear S I R,

I Have been adding this last Year's Notes to the former, and I have found enough to cause me to make considerable Alterations and Amendments every where, and especially in the Table [of Spiders] I sent you : So that I could wish it in my Hands again ; and (if you think it worth the while) an other of yours in Exchange. I am sorry that your Catalogue is not yet i'th' Press ; and yet, methinks, those Experiments that you tell me you have received from *Dr. Needham*, and your other Friends, will be mighty Enrichments: I long to see what they are. As for the *Juices* I sent you, the one is drawn from *Centaureum Luteum*, the other from *Lactuca Sylvestris*. My Notes of this Nature being, for the most part, but of one Year's standing, I am loth to venture raw Conjectures, even before so kind a Judge as you are of my Papers ; otherwise, I assure you, there is nothing I have observed or tried, but I would willingly impart. I know you have not been un-employed about prosecuting your Experiments upon Trees, and I should be glad to know the Success, both as to the Motion of the Sap in them, and likewise the Texture ; about which last I am confident *Mr. Willughby* is very thoughtful and diligent, and I hope fortunate.

Mr.

Mr. Wray to Mr. Lister.

Dear S I R,

I Have sent you enclosed two Papers; the one containing Descriptions of Birds, which you communicated to Mr. *Will* at his last being at *Wollarton*; to which we have added the *Latin* Names of *Aldrov.* Only the third I take to be a Fowl distinct from the common Widgeon, which is not unknown to you. Indeed I do not remember that ever I saw any Bird of the Duck-kind, which hath a Circle of white Feathers round about the setting on of the Bill. Your Descriptions of the rest that I have seen are very exact. The other Paper being a Table of our *English* Spiders I have sent, not that I can discover any Error or Defect in it, but because you desire it. In prosecuting the Experiments about the Ascent and Motion of the Sap in Trees, I was interrupted by a few Fits of a Tertian Ague; which, I thank God, I have been now a good while rid of. Something I have since done; of the Success I will give you an Account when the Season of Bleeding is quite over. Some Experiments I have made this Spring, which seem not well to agree with those I made the last. My *Catalogue* I believe is not yet begun, the Undertaker, Mr. *Martin*, staying for a new Letter: He promiseth me to take special Care both of the Letter and Paper, and correcting, that it may, in all Respects, be well done. My *Collection of Proverbs* I have given to Mr. *Morden* of Cambridge, who desired it of me, and promises to get it well printed. We do now shortly expect the *Bishop* of *Chester* here, for whom principally I stay at present, my private Affairs calling me into *Essex*. When I have had Conference with him,

and

62 *Mr. Wray to Mr. Lister.*

and settled and stated Things concerning his *Universal Character*, I intend to set afresh upon and dispatch the Translation, that so I may be free to prosecute my own Inclinations and Studies. Having but little Time, I can add no more than my best Wishes and Prayers for you, and for your Lady's good Success; remaining, as always.

*Mr. Wray to Mr. Lister.**Dear S I R,**Wollarton, April 28. 1670.*

THIS next Week we expect the *Bishop of Chester* at *Middleton*, who desires our Assistance in altering and amending his Tables of Natural History. To make exact Philosophical Tables, you know, is a Matter very difficult, not to say impossible: To make such as are tolerable, requires much Diligence and Experience, and is Work enough for one Man's whole Life; and therefore we had need call in all the Assistance we can from our Friends; especially being not free to follow Nature, but forced to bow and strain Things to serve a Design, according to the Exigency of the Character. To what Purpose you'll say is all this? To make Excuse for this Importunity in begging your Table of Spiders, which I earnestly desire you would send us to *Middleton* as soon as possibly you can; tho' not so perfect as you intend it, yet as it is: For this Work hath stuck long upon our Hands, and we do now resolve to dispatch, and get quit of it. My general Catalogue I have lately heard nothing of: I am afraid they have not yet begun it. Some Weeks since the Bookseller wrote to me, to know whether I would be willing to respite the Printing of it for a Fortnight, till he might get a new Letter cast for it.

I re-

I return'd him an Answer, that I was willing, if he thought it for his own Interest, because I thought it would be for the Advantage of the Book. My Collection of *English Proverbs* I have also dispatch'd away to Mr. Morden, who desires the Printing of it. Being e're long to take a Journey into *Essex*, I accompanied Mr. *Willughby* hither, partly to take a View of these Parts at this Season of the Year; partly out of some Hopes (though I confess very little) of finding you here. I have here observed growing about *Nottingham-Castle Walls* the *Lychnis*, called by *Gesner*, *Polemonium Petræum*; which I remember to have sometimes mention'd to you, brought us first from thence by *Willisell*. And, on the sandy Grounds, a Sort of small Vetch, now in Flower, which I have not before observed; though it is likely it may elsewhere be found. Also *Auricula muris pulchro flore* *J. B.* and *Nasturtium Petræum*, by some called *Bursa pastoris minor*, are frequent in the sandy Grounds hereabout, now in Flower: Else I have discover'd nothing to me absolutely new, tho' it is a little too early in the Year for Simpling, especially the Spring being very backward.

Mr. Lister's Answer to the foregoing Letter of Mr. Wray.

My dear Friend,

Carleton, June 4. 1670.

THE Beginning of *May* I returned an Answer to both your last Letters to me, and likewise enclosed the Table of Spiders you desired of me. They were sent by the Post to *London*, and I hope did not miscarry: However, I cannot be satisfied concerning them until I hear from you; and therefore

I have

I have sent you this Billet by *Wollarton* Gardiner from *Nottingham*.

I cannot tell what to add, but that I intend you an Account of my Simpling here, before or about Autumn. Yet because some Plants in your Catalogue now in printing stand upon my Parole; concerning the one of them, I was abundantly satisfied, having found it in that Plenty above *Skipton*, and in the Beck from thence: And as for *Valeriana Græca*, I have found that also in an unquestionable Place this last Week, both with a white Flower; and also a blue one, viz. under *Maulam Coze*, a Place so remarkable, that it is one of the Wonders of *Craven*. It grows there on both Sides the Spring in great Tufts; and if the Catalogue be not yet printed off, I could wish that this Place might be added to the former. I have found many Plants near to me, which I will reserve to another Opportunity; not willing to make this more than a Billet.

Dr. Hulse to Mr. Wray.

S I R,

AS to my Observations of *Spiders* projecting *their Threads*, take them thus. I have seen them shoot their Webs three Yards long before they begin to faile, and then they will (as it were) fly away incredibly swift: Which Phænomenon doth somewhat puzzle me, seeing oftentimes the Air doth not move a quarter so fast as they seem to fly. Mostly they project their Threads single, without any dividing or forking at all to be seen in them: Sometimes they will shoot their Threads upward; and will mount up with them in a Line almost perpendicular; and at other times

times they project them in a Line parallel to the Plain of the Horizon, as you may often see by their Threads that run from one Tree to another, and likewise in Chambers from one Wall to another. I confess, this Observation, at first, made me think they could fly, because I could not conceive how a Thread should be drawn parallel between Walls, as above-said, unless the Spider flew through the Air in a strait Line. The way of forking their Threads may be express'd by the following Figure:

What Reason should be given of this *dividing*, I know not, except that their Threads, being thus winged, become able to sustain them in the Air. They will often fasten their Threads in several Places to the Things they creep up; the Manner is by beating their Bums, or Tails, against them as they creep along. This Line will express the Way.



By this frequent beating in of their Thread among the Asperities of the Place where they creep, they either secure it against the Wind, that it is not so easily blown away, or else whilst they hang by it, if one Stich break, another holds fast; so that they do not fall to the Ground. There is another thing I have to deliver about these Webs; but as yet I am in some Doubts about it, and therefore at present I shall remain.

June 28. ---70.

Note, Notwithstanding this Letter of Dr. Hulse was published by Mr. Oldenburgh from Mr. Wray, in *Phil. Transf.* N^o. 65. Yet I think fit to reprint it, that the Reader may have all the original Letters relating to the first Discoverer of that curious Phænomenon of the *Flight of Spiders*, which I have spoken of in my *Physico-Theol.* Book 8. Ch. 4. Note 5.

The true History of the *Invention* I take to be this. Some time after Mr. *Wray's* Return from his Foreign Travels, (which was in *March* 1668) Dr. *Hulse* told him of *Spiders darting their Threads*, i. e. transversely, with Force, parallel to the Horizon. Mr. *Wray* consults Dr. *Lister* about this, he being the best acquainted with this Tribe of Animals of any Man. His Letter to this Purpose you have *Pag.* 34. (which unfortunately is without the Date of the Year, but was, I guess, in 1668) Dr. *Lister* in his Answer, *Pag.* 36, (without any other Date also than 10 Kal. *Dec.*) acquaints him, that *Spiders* not only shoot out their *Threads*, but fly also upon them, and shews the Manner how he came to discover it. After this, Dr. *Hulse* wrote this very Letter to Mr. *Wray*; which being curious, and particularly in relation to *Spiders*, Mr. *Wray* sent an Account of it to the Royal Society; and finding it questioned which of his two Friends, Dr. *Lister*, or Dr. *Hulse*, first made the Discovery, Mr. *Wray* writes the Letter of Excuse following of *Jul.* 17, 1670; and after that, the other of *Apr.* 13, 1671; which, no Doubt, gives the true State of the Discovery, viz. That although Mr. *Wray* had the first Hint from Dr. *Hulse* of *Spiders shooting their Threads*, yet the Discovery of their *Flight* was first told him by Dr. *Lister*. And in all Probability these two ingenious Gentlemen, bending at the same time their Enquiries about the same Animals, might hit upon the same Discoveries. As I well remember, that when I my self was first prying into this Matter, I soon saw the *Spiders* take their Flight, as well as dart their Webs from the Tops of Thistles, &c.

W. D.

Mr.

Mr. Wray to Mr. Lister.

S I R,

Wollarton, June 29, 1670.

FOR my own part, I have made few Discoveries in Plants this Summer; only I have observed *Gramen agrorum venti spicâ* Lob. to grow very plentifully among the Corn in the sandy Grounds in this Country, and have now seen the *Polemonium Petræum* Gesn. in Flower and Seed all about Nottingham-Castle on the Walls and Rocks. The *Pink* which grows by the Highway Sides of the sandy Hill you descend going from Nottingham to Lenton, I find to be the same with that which grows on the Hills about Sandy in Bedfordshire, near Juniper-Hill in Cambridgeshire, Bridgenorth in Shropshire, and in many Places of Berkshire. Tho. Willisell sent me *Alsine foliis hederaceis rutæ modo divisis*, (if I mistake not I use Bauhine's Name) which he found some where in Norfolk, and a Sort of *Willow* growing about Darking, which, as he saith, casts its Bark, and stands bare some part of the Year. *Mistletoe* growing on the Hazell, I took Notice of this Spring near Braintree in Essex; but that is a Thing scarce worth the mentioning. Your Experiments concerning the Motion of the Sap of Trees do marvellously agree with those we have this Year made, as you may perceive by a Letter of Mr. Willughby's, inserted in the Philosophical Transactions, wherein there is a bad Mistake, which perverts the Sense, of the Word *Morning* instead of *Noon*. Mr. Willughby presents his Service to you, and wonders you should stick so to the Number of 31 Species of Spiders; whereas either he deceives himself, or he hath found out many more, and believes there may be, at the least, double that Number in England. In your

Table of Spiders I do not well understand the Term *Scutulata*, whether it be to be understood of the Texture and Meshes, or the Figure of the Webs. Pardon this confus'd jumbling of Things together, for I have not Leisure enough to consider what I write, nor to add more.

Mr. Wray to Mr. Lister.

Dear Friend,

Middleton, July 17, 1670.

IN my last I committed a Mistake, and therefore it is requisite I make Haste to mend it. It was in the Name of the *Alpine*, which I told you *Tho. Willisell* found in *Norfolk*, and sent to me. I should have titled it, *Alpine folio profundè secto, flore purpureo aut violaceo* J. B. *Triphyllus cærulea* C. B. The Name I sent you in my last is *Lobels*. *Tho. Willisell* hath been lately here in his Return out of the North, and brought with him several rare, and some *non-descript*, Plants, viz. *Pyrola Alpinæ flore Europæa* in Flower, which he found in *Northumberland*, near the *Picts* Wall, five Miles from *Hexham*. *Salix pumila folio rotundo* I. B. on the Top of *Ingleborough-Hill*. *Echium marinum* P. B. near a Water-Mill between the *Saltpans* and *Berwick*. *Orobis Sylvaticus* n. d. at *Bigglesby*, five Miles from *Pereth* in *Cumberland*. *Chama-periclymenum dictum sed malè* on the North-West of the highest of *Cheviot-Hills*. *Pentaphylloides fruticosum sive arborescens*, an elegant Plant (and as I think not described) on the Banks of the River *Tees*. *Vitis Idæa magna quibusdam, sive Myrtillus grandis* J. B. in *Cumberland*, at a Place called *Orton*, in the Midway between *Hexham* and *Pereth*. These I have inserted in the Appendix of my Catalogue, which now goes on apace, having received six Sheets more since I wrote to you,

you, which reach as far as the Beginning of M. The Appendix is now grown, I think, as great as one fourth Part of the Book, I having gained several new Medical Observations, which I hope may be of good Use. This Summer we found here the same horned *Eruca*, which you and I observed about *Montpelier*, feeding on *Fœniculum tortuosum*. Here it was found on common Fennel: It hath already undergone the first Change into a *Chrysalis*, and we hope it will come out a *Butterfly* before Winter. I must deprecate your Displeasure for publishing to the World (in case Mr. *Oldenbergh* print my Note, as I believe he will) that Dr. *Hulse* was the Man from whom I had the first Notice of *Spiders projecting their Threads*. The Observation is yours as well as his, and neither beholden to other (that I know of) for any Hint of it, only he had the Hap to make it first; and being question'd about it, I could do no less than own the first Discovery of it, to me, to be from him, who indeed communicated it to me so soon as I saw him, immediately after my Return from beyond Sea. I long for an Account of the Fruit of your Summer's Simpling. I believe few Things thereabout will 'scape your Notice; and yet you are in one of the best Quarters of *England* for Variety of choice Simples. I would not have you think of buying my Catalogue, for I design you one so soon as it is printed, if I may know how to convey it to you. Let me not lose your Love and Friendship, which I do very highly prize; and therefore should be loth to do or say any thing which might give you any Displeasure; or alienate your Mind from me, or in any Measure abate and cool that Affection and good Will which you have professed to me.

Mr.

*Mr. Willughby to Mr. Wray from
Ludlow. 13 Kal. Augusti.*

F. W. Johanni W. S. P. D.

NUNC scribo ut te certiores faciam, quòd Episcopus noster in reditu è Fonte Spadano prope *Banburiam* (ubi aquas nunc bibit) *Middletoni* cupit tabulas suas perficere & emendare. Obnixè igitur rogo ut sinè morâ illuc festinares ; ut si fieri potest ibi sis ante Idus *Augusti*. Sinè te enim frustra erit aliquid ejusmodi aggredi.

Mr. Willughby's Observations.

Of Enameling.

MOST of the Pastes come from ——— They first engrave the Rings to receive the Enamel ; then lay on the Enamel, and put it either in a Furnace ; or for a single Ring, lay it on a Charcoal, and melt it with the Blast of a Lamp, blown upon it with a crooked Pipe ; then they rub it smooth with a Whetstone, and melt it again, and at last restore a Gloss, by boiling it in Water where there is *Aqua Fortis*, &c. and at last rub it over again with a smooth Steel.

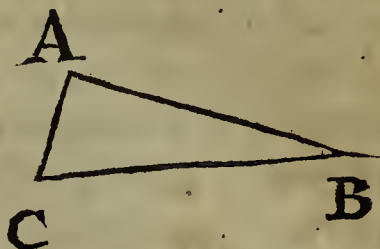
Of Soddering.

To sodder Gold, they always use the coarser to sodder the finer : They dip a thin Plate of Gold in *Borax* ; and laying it in the Chink to be sodder'd, then they melt it with the Flame of a Lamp.

A Ring

Mr. Willughby's Observations. 71.

A Ring may be stretched to any Bigness, by driving a Cone, or the Segment of a Cone, into it. Fishes are made biggest before, that they may always move easiest forwards; it having been found out by Sir *William Petty*, that a Triangular Piece of Wood A B C will always move in Water with the great End A C forwards, tho' it receive the Impulse upon the Sides A B C B.



Mr. Ray to Dr. Lister.

D. Martino Lister Jo. Raius, S. D:

Amice charissime,

Catalogum meum plantarum Angliæ ad te tandem mitto; mole quidem non ita magnum, at pretio minorem. Nescio an aliis placiturus sit, mihi certè minimè placet: nec enim in iis quæ scribo mihi met ipsi unquam satisfacio: in hoc ego affectum erga me tuum agnosco, at iudicium desiderare cogor, quod autor mihi fueris ut eum emitterem. Præter illa quæ ad calcem libelli emendata invenies, alia inter legendum errata observavi, operariorum incuriâ admissa, quorum graviora, in exemplari quod misi, calamo emendavi; leviora illis ignoscas, tibi; ipsi emendes rogo. *Valerianæ Græcæ* locus quem inferendum Bibliopolæ mandavi, Typographi negligentia nescio quomodo omissus est, magno meo dolore. De scriptoribus Botanicis antiquis & recentioribus quæ sentiam in medium proferre, deq; eorum scriptis censuram exercere, non sum ausus, nè crabrones irriterem. Cùm enim aliquid necessariò dicendum foret de nonnullis qui adhuc in vivis sunt, cùmq; librum si malus est nequeam laudare & poscere, eorùmq; diatribas & rhapsodias

sodias vituperio potiùs quàm laude dignas judicarem ; ne eorum offensionem incurrerem, & ut quieti meæ consulerem, consultius duxi locum hunc de Botanicis omnino intactum relinquere, deq; eorum operibus altùm filere, si ità loqui liceat. Quod tibi communicem à me noviter inventum, aut observatum, nihil aliud habeo quàm quod in Philosophicis Transactionibus dictis invenies, de *Ape quâdam sylvestri* quæ mirâ arte nidificat (ut ità dicam) aut cellas fabricat fœtui suo è particulis foliorum Rosæ decisis ; quarum locum, magnitudinem, figuram, usum ibidem descriptos invenies.

Videbis me in titulo catalogi & dedicatione literam nominis mei initialem W abjecisse, quod nè mireris, fateor tibi, me eam olim, antiquâ & patriâ scriptione immutatâ, citra idoneam rationem adscivisse. Restat jam ut consilium à te petam, nuperrimè enim amplissima mihi conditio oblata est, si velim tres adolescentes celebri loco natos, in exterarum regiones peregrinatos aut ducere aut comitari, consilióq; meo & operâ juvare. Ego certè meipsum tali negotio imparrem & minùs idoneum judico ; nec si idoneus essem puto me tantam mercedem aut stipendium mereri posse. Centum libræ annuatim offeruntur, necessariis omnibus expensis etiam persolutis. Tu quid de hac re sentias ocyùs rescribas.

Media Villa xi. Kal. (Aug. 22.) Septemb. 1670.

Dr. Lister to Mr. Ray from York, in Answer to the foregoing Letter.

From my House without Michel-gate Bar in York, Oct. 8. 70.

Dear S I R,

I Will not omit, that having boared deep into a fair and aged Sycamore the latter End of *May*, it did not run at all, neither what remained of that Month,

nor

nor the Month following that I observed; but the Bark put out a Lip, or Wreath, and seemed to heal. The Beginning of *July* I cut out an Inch or more Square of the Bark, at about my Height in the Body of the same Tree. This Wound ran the next Morning so as to drop, and yet always towards Noon it dried; and the same Wound, for 21 Days after (which was as long as I stay'd to observe it) never failed to drop in the Morning, and to dry before eleven. This Experiment I repeated upon a much less Tree, and for five Days it succeeded in like manner, but then gave over. The deep bored Wound in the first large Tree was not altogether dry (altho' it seemingly was heal'd) at running Hours.

I have added this Summer three Sorts of Spiders to my 31. You may explain *Reticula Scutulata*, by adding *in planâ circuli figurâ*: And so *scutulata* will be limited to the Meshes.

This Letter was writ, as you may see, before I received yours, and had been sent, but that I deliberated a Post, whether it was not safer to send it by *Nottingham*. I thank you for my very welcome Present, [*viz. Catalogus Plantarum.*] I am still of the same Mind, and rejoice that it is publick; and I am confident considerate Men will think themselves highly obliged to you, both for your new discovered Plants, and for the Pains you took in correcting the Faults and Mistakes of others; that is, you took Pains to save it us, most Writers of this Subject having been more vain, than diligent and cautious. I was pleased with the Derivation of your Name whilst *U* was at it, it agreed so well with a Virtue so eminent in you, and which, I am confident, you will never lay aside; however you please to alter the writing of your Name: You well know what *Vray* in *French* means. I have not seen the last Philosophical Transactions yet: But I observed a *Bee* much like the *Hive-Bee* in Colour, yet somewhat broader

L and

and flatter. The Manner of housing of her Young with Leaves I shewed to many of our Fellows when I was at the College. They make use of all sort of Leaves indifferently for this Purpose, as the Sallow and Thorn, and they were mightily pleased with the soft Leaves of certain Blew-pipe Trees, or *Litax*, which grew in our Walks: The long Pieces are scaled one upon another, and the round ones do stop up both Ends. There was a single Bee-worm in each Cell, and Provision of Meat: They were one rammed upon another in Holes deep-bor'd into the Body of a Willow, &c. But I shall leave all the History in Philosophical Transactions. I joy you of the Condition offered you. If you accept it, I wish you all the Satisfaction and Comfort in the World of it; and I pray God of his infinite Mercy to preserve you in your Travels, and to send me home again my dear Friend well. Fix not long with them in any Place; for the Gentry of *France* are very proud, and will soon (when acquainted) learn them to despise their Tutors, however well deserving. I pray take special Care how I may entertain a Correspondence with you abroad.

Mr. Jessop to Mr. Ray.

S I R,

IN Answer to your last, I give you this following Account of those Things you enquired after, from Mr. *Fisher's* own Mouth. A weak Spirit of Pismires turned Borage Flowers red in an Instant: Vinegar did the same, a little heated. This I saw.

Generally Spirit of Vitriol, Spirit of Salt, and all acid Spirits, turn the Leaves of Herbs, Flowers and Berries, of what Colour soever they be, into red.

Any

Any Alkali will restore them into their former Colour, as was shewn me in several Experiments.

Pismires distilled by themselves, or with Water, yield a Spirit like Spirit of Vinegar, or rather like the Spirit of *Viride Æris*.

Of this they have distilled great Quantities, and given it inwardly and outwardly in Consumptions, with good Success.

Lead put into the Spirit, or fair Water, together with the Animals themselves, being alive, makes a good *Saccharum Saturni*. Iron put into the Spirit, affords an astringent Tincture, and, by Repetition, a *Crocus Martis*.

Take *Saccharum Saturni* thus made, and distill it, and it will afford the same acid Spirit again, which the *Saccharum Saturni* made with Vinegar will not do; but returns an inflammable Oil with Water, but nothing that is acid. And *Saccharum Saturni*, made with Spirit of *Viride Æris*, doth the same in this respect with Spirit of Pismires, which no other acid Spirit made of Vegetables doth that he knows of.

But, in this Particular, Spirit of Pismires comes nearer Vinegar and Spirit of Nitre, than Oil of Vitriol, Spirit of Salt, or the acid Spirit of Sal Armoniac, in that it makes an astringent Tincture of Iron, and the others an aperient.

When you put the Animals into Water, you must stir them about to make them angry, and then they will spirt out their acid Juice.

No Animal that ever they distilled, except this, yields an acid Spirit, but constantly urinous; namely, an Oil and a saline Spirit: And they have distilled many, viz. as Flesh, Fish and Insects.

They desire you to enquire, whether any other Animal distilled did ever yield any acid Spirit.

They have made of Pismires divers Salts, of which you may hear more hereafter, if you desire it; but at present they had not Leisure to consult their Notes.

As for what concerns Plants: They preserve their expressed Juices with some few Drops of Spirit of Sulphur; so little, as communicates no sensible Taste to the Juices: They also perfume the Bottles with Smoak of Sulphur. They desire, that if you make this publick, you would be pleased to suppress their Names, lest the Apothecaries hereabouts should know that this is the Way they use.

Make a strong Decoction of *Carduus Benedictus*; into a Quart of it, put 6 or 7 Drops of Spirit of Sulphur, and in a few Days the Decoction will lose most part of its Bitterness. They cannot find that the Spirit of Sulphur hath the same Effect upon other bitter Herbs. I tasted of the Decoctions of Wormwood, Germander, Feverfew, in which they said they had dropped Spirit of Sulphur, which were extremely bitter; but a Decoction of *Carduus*, into which they had put the same Quantity of the Spirit, was almost insipid.

They have observed something in the Juices of Herbs as an Indication of their Virtues, analogous to what they have observed in Urines as an Indication of the Diseases; and this in three Particulars, the Colour, the Consistence, and the Froth.

The Colour of the Juices will be of a deeper or a paler red, as hath been formerly observed.

As to the Consistence, they have observed a strange Variety of Differences: Some will let fall their Dregs very soon; others not under many Weeks or Months. In some the Liquor that swims above will be more crass; in others more tenuious. The Particulars are very many; of which you may have an Account, if you think it for your Purpose.

As to the Froth they have observed in some Herbs proper for the Breast, (namely, such as they used to give the Juice of;) that being shaken, there arises a great Froth, which stays in some many Days, in some many Months, before it turn to Water. They
named

named the Juices of Daizies, expressed from the Flower and Herb together, which they said frothed most of any, being a little shaken: As also Ground-Ivy, and others, which they held for Secrets.

In one or two proper for the Head, they observed little Froth: They named Betony.

They desire this Experiment may be thoroughly tried, if you, or any of your Friends, will take so much Pains; because they think it may be of Advantage.

They observe, that some Herbs, which, singly taken, do not purge; yet, mixed together, will purge strongly.

Centaurry, Lavander, Hyssop, Colts-foot, Fennel-roots, of each a like Quantity, boiled together in Water, and sweeten'd with a little Honey, did violently purge two several Persons, who took three Spoonfuls of this Decoction at Morning and Night; and gave them Ease in a Shortness of Breath proceeding from a Scorbutic Distemper. He desires that it may be tried, to see whether it will do the like with others. It worked not until the second Day.

Mr. *Fisher* thinks, that the small Quantity of Spirit of Sulphur, added for the keeping of the Juices, may contribute to the Increase of their Redness, but not altogether cause it: For he observes, that the same Juices, unmix'd, will grow red with standing.

Octob. 24. 1670.

Mr. Jessop's Letter to Mr. Ray without Date.

S I R,

IN Answer to your last, I say, that although it pass for a general Rule, that acid Spirits change the Juices of Herbs, Flowers and Berries, into red,
or

or a Colour something inclining to red; (for you will find a Variety almost in every Experiment you shall make;) yet I intend not thereby, that the Rule should be so general as to admit of no Exceptions. And yet I believe, that if the Experiment be made with Care, there will be found fewer Exceptions than you will be apt at first to imagine. I believe Dr. *Hulse's* Experiment upon Cichory Flowers might have the Success you relate: For the Juices of all Flowers are included in a Membrane, which some Spirits, altho' they seem very acid, yet may not pierce, and so not work the Effect upon the included Juice. To confirm this, I remember that once we put either Borage or Cichory Flowers, I cannot well tell which, into cold Vinegar, and we could not perceive the Colour to alter, altho' we let it stand for a considerable time; but heating the same Vinegar, and putting other Flowers in, they immediately changed, the Heat, as I suppose, softening the Membrane, and so opening a Passage for the Vinegar into the Juice. Mr. *Boyl's* Experiments were made upon expressed Juices, either in Glass-Vials, which questionless is the best way, or by bruising the Flower, and staining a white Paper with the Juice. Those Trials he made by the Infusion of the Flowers themselves, sometimes succeeded, and sometimes not. But I do not value any Exception made against the Rule, if it be grounded upon either of these two latter Ways of Examination; for if in a great Glass full of Juice of Betony you can perceive but a very light *Vestigium* of Redness, altho' you hold it so, that the Rays of Light are refracted through the whole Mass; what can we then expect to see in a Paper slightly moistened with that Juice, or a thin Leaf of a Flower? You may satisfy your self, that Spirit of Salt hath turned blue Juices red, if you please to consult Mr. *Boyl's* Book of Colours: Part 3. Experiment 20. and 21. There you will see it hath changed Syrup of
Violets,

Violets, and Juice of Blue-Bottles ; and I doubt not but it will change also Cichory Flowers, tho' perhaps with some Variety, if the Trial be made as it was there.

The only general Exception that Mr. *Fisher* knows of, is, that acid Spirits do not work upon Juices of Plants or Fruits that are very acid. Juice of Lemons, they say, will not change by the Infusion of any acid Spirit they know of, no not by standing long, and Corruption, which will change the Juices of many other Fruits or Plants, altho' they be acid. They have also made Trial of white Currans, but cannot perceive that acid Spirits alter them. The Reason, I suppose, why Juices turn red by standing is, that in time, by a long Fermentation, the acid Spirit loosens it self from the other Parts, and then works the same Effect upon them which an infused Spirit doth at first. I infused Wall Flowers in Spirit of Salt, as Mr. *Boyl* somewhere saith he did Leaves of yellow Roses, but could observe no Change ; and yet I am not satisfy'd fully, until I make trial of a considerable Quantity of the Juice. I told you, that Alkali's restored Juices to their natural Colours again ; but I must recant : For altho' it happened to fall out so in some Trials I saw made, yet they say generally they turn them into green, or at least some Colour that hath some Tincture of green : But yet this Rule is far from being general, as they confess ; as also you may observe in reading Mr. *Boyl*.

As for what concerns their Experiments about Pismires, they give you Leave to dispose of them as you think good, and do not refuse to own them. They have distilled Beetles, and many Sorts of *Eruca's*, but not Bees, or any of that Kind ; as also Fish and Flesh. They desire that some Body would endeavour to rectify this Spirit as highly as it is capable, by impregnating calcined *Viride Aeris* with it several times, or some such like fixed Salt, which may retain the Spirit

Spirit until the Flegm be raised by a gentle Heat ; for unless there be some such *Retinaculum*, the Spirit and Flegm will rise together. If it be thus prepared, they think it will prove a very strong Dissolvent : They think the best way of getting this Spirit pure, is by putting the Insects into Water, for so you have nothing but the acid Juice ; if you distil the Animals themselves, there may perhaps something arise from the other Parts of their Bodies of an heterogeneous Nature : But the best of all will be to try both ways, and observe the Difference, if there be any.

As to what concerns the *Preservation of Juices* : They do not tie themselves strictly to Spirit of Sulphur, altho' they use it more than any other. Other acid Spirits will do the same, and sometimes better for some particular Herbs ; and therefore they use them indifferently, according as they find, upon Trial, any Convenience or Prejudice ; and sometimes they perfume their Vessels with Smoak of Sulphur, and sometimes not.

Note, *Although some of those Observations and Experiments of the two Fishers of Sheffield, and those that follow of Dr. Hulse's, are in the Philosophical Transactions ; yet these Letters containing some other considerable Observations besides these, I thought it convenient to present the Reader with the Letters as I found them, without mangling of them.* W. D.

Dr. Lister to Mr. Ray.

Dear Friend,

York, December 22. — 70.

I Am very glad Mr. *Willughby* is near well again, and I thank God for his Recovery, and do heartily pray a Continuance of good Health to him. Me-
thinks

thinks he is very valetudinary, and you have often alarm'd me with his Illnesses. My humble Service to him. I thank you for the Book of Proverbs you design me. I cannot methinks exclude these hair-tail'd Insects from the Family or Genus of Wasps, altho' all of them that I know, are, in a strict Sense, neither Favicous nor Gregarious, nor have artificial Meat stored up for them; yet have they the Shape and Parts of Wasps exactly, as well in the Worm and Chrysalis, as when they are in Perfection: Besides, I have observed a peculiar Note belonging to the Bee-Kind, which is not wanting in these; and that is three Balls in a Triangle, in the Forehead of them all, which no body hitherto, that I know of, has taken notice of. But I much like the making of Genus's and Tribes *ex moribus & vitâ*; tho' I would not, as near as may be, have the Form excluded. I have now seen the *November* Book; and I find in my *Adversaria*, that I have formerly dug out of the Ground at *Burnell* in *Lincolnshire* many just such-like Cases, made of thin Waters, or Membranes, one sticking in a direct Line to an other, &c. In the same Place I very frequently met with little hollow Balls, of the Shape and Size of Pistol Bullets, of yellow Wax, wherein was one small white Maggot, without any Meat at all. Indeed these Balls were much tenderer than Wax, and of a very fragrant Smell, and perhaps might serve them as well for Food as Housing. If I had the Table of Spiders, I now could make some small Alterations and Additions to it. I have this last Month writ over a new Copy of my History of Spiders, (which is the 4th since I put my Notes into any Order) and inserted therein all the last Summer's Observations and Experiments. I find only two or three new Spiders, and one to be removed into another Tribe, to which it more properly belongs. When you please to send me an Account of the acid Liquor of Pismires, I will return something concern-

ing the gilding of a Chrysalis, which is a pretty Phænomenon.

I know not what to think of the Uncertainty of the Experiments we make concerning the bleeding of the Sycamore. I have observed almost daily two Trees, which I pierc'd in several Places the first of *November*; but to this Day no Signs of the stirring of any Juice, which indeed surprizes me, we having had two or three pretty hard Frosts already; yet neither at their coming, nor going away, made they any sensible Alteration as to this Particular. In my last Year's Journal I find, that, particularly the 17th of *December*, there was a very copious Bleeding; and onwards I find this *Memorandum*, that in some great Bleedings there was still to be observed a mighty Reeke or Steam arising from the Ground; and, indeed, this kind of Thaw has not yet happened at *York* this Year. I desire to know what Success you have met with this Year in such-like Experiments.

I am glad to hear you have spared your Person, in not exposing your self to I know not what Inconveniences. As for the searching of the *Alps* once again, it would have, no doubt, been very beneficial to the common Wealth of Learning, but that is enough obliged to you already.

Dr. Hulse to Mr. Ray.

SIR,

YOURS came safe to my Hand. I thank you for the Experiments contained in your Letter. I had thought to have tried some other Experiments with Pismires; but now I must stay till next Spring. The Juice of these Insects will ferment with the
Powders

Powders of Chalk, Pearl, &c. as other Acids do. Any blue Flowers being a little bruised; and a Drop of Spirit of Salt, Vitriol, &c. dropt upon them, do instantly turn red; but if you drop these Spirits upon the Surface of the Flowers, whilst they remain whole and unbruised, they change not at all; and I suppose that Spirit of Vinegar, dropt cold upon them, would make no Alteration; but if you heat it, then the Warmth of it opens the Pores of your Flowers, whereby the Spirit doth easily commix it self with the contained Juice, and thereby presently changeth their Colour: And it's probable any other acid Liquor would effect the like Change, if it were heated beforehand. It is probable to me, at present, the Juice contained in the Body of the Pismire is all of it acid, and of the same Nature with that included in their Stings, which may appear from the Spirit that is distilled from them, which surely does not all come from their Stings; as likewise, if you bruise a Pismire upon any blue Flower, the expressed Juice will tinge the Flower. Now, tho' it be likely enough, that the Liquor which comes from the Stings of Bees, Wasps, &c. being corrosive, may discolour Flowers; yet I believe the Juice expressed from their Bodies, will not do the same, though as yet I have not made Tryal. It may be a *Quære* whether the Liquor of Pismires be not stronger, and more penetrating, than any of the above-mention'd Acids. If so be that the Liquor dropt upon the Surface of the Flowers, whilst they are whole and unbruised, do turn them red, then it is manifest it is; but if the Liquor be convey'd through the Sting, which (the Ants being angered from stirring of their Hill) they thrust into the Body of the Flower, then the Doubt will remain, because then the Liquor does immediately mix it self with the Juice of the Flower. If so be that the weak Spirit of Pismires you mention'd, that immediately turn'd the *Borax* Flowers red, were not heated, it

seems to evince that their Spirit is stronger than any of the rest: But these Things will be best clear'd when the Season of the Year will permit. Your Note upon Mr. *Fisher's* asserting that any Flowers turn'd red, will be restor'd to the former Colour by any Alkali, is most certainly true; and he's mistaken, as I have more than once try'd.

Mr *Paschal* of *Queen's-College* was lately at *Hackney*, and has left several Moulds, wherein Coins have been cast, in Dr. *Worthington's* Hand, and desired him to deliver them to you when you came to *London*. The Doctor desired me to acquaint you concerning them: They were digg'd up in *Somersetshire*; in my Mind they are a greater Rarity than the Coins themselves. If you think it worth your Labour, you may communicate, what I have communicated to you, to the Royal Society. I shall be glad to hear from you; And so, in haste, I remain.

Jan. 6. $\frac{7^{\circ}}{71}$.

Dr. Hulse's Receipts for the Dropsy, &c.

S I R,

THIS following Pasty I have known to cure very great Dropsies. I remember, my Father, when I was a Boy, had a Man, whose Belly was swelled to that Degree that his Wasteband would not meet by a Span, who was perfectly cured by it: And I had a Sister who cured several with it. Take Rye, Meal, (some use equal Quantities of Rye and Barley) and make a Pasty that will hold a Peck of Sage-Leaves: When you have fill'd it with the Sage, lid it, and bake it in an Oven; when it is baked, take it and break it into a Canvas Bag, and hang it in a
Barrel

Barrel of pretty good Beer; and when it is ready, drink it for ordinary Beer. Take the green Rind of young Elder, a good handful, boil it in a Gallon of White-Wine to the half; drink a good Draught of it cold in the Morning, and warm at Night, as an approved Medicine in a Dropsy, *Dr. Page*. I have known this do extraordinary well, as it is set down by *Dr. Sydenham*, *Nempe M. iij corticis interioris sambuci*, &c. *Sydenham*, p. 263. This following Drink was used by an eminent Physician. Take Ashes of Broome one heaped Quart, of the Vine which bears white Grapes, &c. Bean Stalks and Shells, each one Pint: Put to them 12 Pints of White-Wine, and let them stand close covered at a gentle Heat for 8 or 10 Hours; after that let the Wine run twice or thrice thro' a Gelly Bag, and put into the Wine Nutmeg and Cinnamon, of each half an Ounce; 20 Bay-berries; of Cummin-seed, Anis-seeds, and Fennel-seeds, each one Ounce: These are to be powdered, and tied in Bags, and hung in the Wine; keep it close cover'd. Those that are poor, and are not able to ascend to Wine, may use Water, (or good Beer;) such as *Tunbridge*, &c. are best. This is exceeding good, after general Purgings, in all Sort of Dropsies. I have known (says the Author) divers recovered out of desperate Tympanies hereby: They must drink every Morning half a Pint hereof; so about 5 a-Clock in the Afternoon, for 20 Days together. They may take it with Sugar, or with Syrups that are proper. This is good against Sand or Gravel in the Kidnies, if you mix with every half Pint 2 Spoonfuls of the Syrup of *Althæa*. If you cannot get the Ashes of a Vine that bears white Grapes, or the Ashes of Bean-Stalks and Shells, I doubt not but the Increase of Broome-Ashes will do as well.—Some affirm, that the Ashes taken themselves in Substance will do better than the Infusion. *Sir Francis Prujean* used to give them as follows.

First

First he purged them with $\frac{z}{3}$ ij *Syrupi è Spir. Cervin.* in a Draught of White-Wine, or Posset-Drink; repeating it every 2^d or 3^d Morning, as he saw Occasion: And on the other Days he gave the Ashes, as *R. Cinerum Genistæ Sacchar. Alb. $\frac{z}{3}$ vi.* or sometimes instead of Sugar, *Tartar Alb. $\frac{z}{3}$ vi. M. sumat cochl. i. tribus horis medicinalibus.*

Dr. Lister to Mr. Ray,

Dear S I R,

I Thank you for the Account of the acid Liquor of Pismires, with the which I am much pleased. It is strange they should light upon no other Animal that will afford an acid Spirit, especially amongst Insects. I had verily thought there were many such, and I yet think so; but I have not had the Leisure to examine many to this End. There is a Separation of an acid Juice, or Spirit, to be made in the Analysis of Vegetables mentioned by Mr. Boyle, and in Glazer: This I guess to be very much a Kin to the acid Liquor of Pismires. *Quære*, whether a *Saccharum Saturni*, made with the acid Spirit of Box, or Oak, (*ex. gr.* after Mr. Boyle's Way) will not give us back the same Spirit again? It seemeth probable it will, since the Pearls seem to have separated its Oiliness, or Soapy Part. The like Effect Copper may have upon the Rape and Wine in making of Verdet. To this Purpose Mr. Boyle, in his last Piece lately extant, tells us, that Spirit of Vinegar, which has been fully satiated with Pearls, will cause a Violet to strike a green, which is the same Effect that an urinous Spirit, or an Alkali, works.

I will

I will subjoin the Experiment I promised you of the gilding of a Chrysalis. To a strong and clear Decoction of Nettles put a small Piece of a black Gall; in time there will emerge a thin Scum; if you then pass the Liquor through a Cap-paper, the Scum left behind will exquisitely gild it. The like I have effected by other Methods, and with other Plants: If the Experiment be well done, it will in all Points look like the gilding of the stiff-hair'd, or prickly-nettle-feeding Caterpillar's Chrysalis.

I have not yet seen *Redis's* Book, neither can I get it, tho' I much desire it. It is true, that Spiders, especially the young ones, are not very shy to shoot their Threads, even in ones Hand; and different Kinds have many different Particularities in this surprising Action. As to the Height they are able to mount, it is much beyond that of Trees, or even the highest Steeples in *England*. This last *October*, the Sky here upon a Day was very calm and serene, and I took Notice that the Air was very full of Webs: I forthwith mounted to the Top of the highest Steeple in the Minster, and could thence discern them yet exceeding high above me: Some that fell, and were entangled upon the Pinnacles, I took, and found them to be *Lupi*; which Kind seldom or never enter Houses, and cannot be supposed to have taken their Flight from the Steeples.

To tell you the Truth, I began to be at a great Loss, when I found that my Experiments concerning the Bleeding of the Sycamore did not succeed this Year as they did the last; for I assure you, that to this Day the two Trees I wounded the first of *November* have not shewn the least Signs of the stirring of any Juice; whereas the *Nottinghamshire* Trees had several times bled e're thus late.

You will be pleased to remember me with a Book of Proverbs, for I long to peruse it.

York, Jan. 20. 1670.

Dr.

Dr. Lister to Mr. Ray.

Dear S I R,

Looking over my Boxes of Insects, I find a Row of about a dozen of these Bees, and some Cases, out of which they were hatch'd. These I find all pierced at the Sides; and for the Bees themselves, they differ much in Bigness, as tho' that was not true, that Insects of this Kind are at their full Growth when born; but it may well be, according to your Observation, that these boisterous and hasty elder Brothers dwarfe the younger by spoiling their Food.

I do not say that I ever found Cases of other Leaves than Roses; but I have found Leaves of many other Trees bit out by them, as Willow, Thorn; and especially a *Lilach* Tree, at the upper End of *St. John's* Walks, had scarce a whole Leaf in it, and some of those Leaves too were well husbanded, as having two or three Side Pieces, and as many round Bits, taken off of them. This I shewed to many of our Fellows, who may well remember it, as Mr. *Gower*, &c. And I know I have yet some of those Pipe-tree Leaves in some of my Books, which are yet most of them at *Cambridge*. I sometimes use my Notes, and sometimes I trust to my Memory, when I writ to you according to Leisure, which may well cause some Difference in Circumstances; but I assure you, I am as circumspect and careful not to impose upon my self and others as I can, and you have well lessoned me to this Purpose; and amongst other things I am extremely obliged to you for it.

As for the *forking of Spiders Threads*; far be it from me that I should slight any Phænomenon of Nature,

Nature, for I am the gladdest Man that can be to hear of any; but I am very cautious not too forwardly to entertain such upon Trust; neither would I have any Man take them from me otherwise than as they themselves shall find them: And this is a Thing that I neither formerly, nor since, have been able to observe; but if it shall be found to be done on Purpose by the Animal, to facilitate his Flight, and not accidental, (which I am the more apt to believe, because very rare) I shall be forward to return Dr. *Hulse* my particular Thanks: But, as I writ to Mr. *Oldenburgh*, he might very well mistake many Threads shot at a time, (as is usual with many Spiders, more or less) for one Thread divided and forked, or as *Blancanus* in *Redi* says, ramose, woolly, or from which many small Filaments proceed; which Conceit of *Blancanus*, I am apt to suspect, gave Occasion to the Doctor to be of the same Belief: But yet for the main, or mostly, as he says, he could not himself find it to be true. I have purposely omitted to insert any Enquiries concerning this Matter, and the Poison of Spiders, willingly reserving those two Particulars for other Papers: Yet I am most glad to hear what others may more happily and more ingeniously observe and experience.

In my Letter of *August*, which was unhappily lost, (by reason, perhaps, that I had enclosed in it a Plant pasted down) I quoted the express Text of *Aristotle*, *That the Thing was not unknow to the Ancients*; and where he says, *That Spiders dart their Threads as Porcupines do their Quills*: Which Text, tho' very plain in it self, yet it will not easily enter into our Imagination, before we have made the Observation by Sense; witness the Misinterpretation of *Redi* and *Blancanus*: And yet in the Sett of Enquiries I sent to Mr. *Oldenburgh*, I have purposely given, to incite the Curious, another Interpretation of the Text;

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which too, perhaps, it will bare, and not much wrested. But too much of this.

I have communicated to Mr. *Oldenburgh* my Notes of the Bleeding of the Sycamore, in Answer to a late Letter of his. He likewise put the Query to me of the Pismires changing blue Flowers red, which it seems some body had sent him in. As for Mr. *Jessop's* and Mr. *Fisher's* Experiments which you communicated to me, I did not send them to him as not belonging to me; but I told him there were such Persons that had better examined the Matter than I. Somewhat after the Receipt of yours, I found another Insect, which I guess will yield an acid Juice, for it most fiercely strikes the Nose with a fiery and acid Smell, just after the Manner of the bruised Bodies of Pismires. This Insect hath no Sting, and is the long and round-bodied Lead-colour'd *Multipeda*, or *Iulus*. Methinks the Juice of that creeping *Flammula* about *Montpelier* was, as far as I remember, much like this of Pismires.

My hearty humble Service to Mr. *Willughby*. If you try the Experiment of gilding, remember that the scum be suffered to become a little stiff and firm, otherwise it will be apt to break into very small Pieces in the Filtre, and not shew so well. I might inclose part of a gilt Filtre, but that it is so apt to break, and wear off with the lightest Touch.

I pity your Pain, which I begin to know a little my self; but in truth I know no certainer Remedy, than one Grain, or less, of *Laudanum* dissolved in Spirit of Wine. This never failed to ease me.

I thank you for my Book of Proverbs: I am much pleas'd with it; but my Wife will have it her Book. Adieu my dear Friend.

Feb. 8.—70.

Our Sycamore bled yesterday at the breaking up of a seven Days continued Frost; and I am now apt to believe, if I had had the Care to have made new Wounds

Wounds upon every like Change of the Weather, that our *York-Trees* would have bled before now. But I affirm no more than I have seen and tried.

Mr. Ray to Dr. Lister.

Dear S I R,

Middleton, March 3. 1670.

I Have not yet had the Fortune to strike any other Trees that would bleed, besides Maple, Vine, Sycamore, Walnut, Birch and Willow. I have heard that the Quicken and Aspen-trees will sometimes bleed; but I could never happen to wound them in that fortunate Hour. Your Experiment communicated to Mr. Oldenburgh, and by him imparted to us, that a Bough of Sycamore, Maple and Walnut, when full of Sap, cut off and held perpendicularly, will not drop till you cut off the Tops of the Twigs, and then it will, to us hath not succeeded. For a Branch cut off hath begun to drop before it was topp'd; nor could we perceive, that striking the Top did at all promote the running out of the Sap: Tho', I confess, the Day when we made this Trial was not very propitious to such an Experiment. All that we found was, that exposing the Branch to the cold Wind, the End downward grew presently dry, and no Sign of Bleeding; but holding it in the Sun, and in the Beams reflected from a Wall under the Wind, it presently began to grow moist, and dropt though very slowly. Looking over my Notes in 1668, I find thus. *March 6*, we saw'd off a small Bough of a Willow, and held it perpendicularly erected: It presently dropt, and that indifferently fast, considering its Smallness, *viz.* once in 14 Pulses. This we tried in 3 Boughs, one after another; all which dropt at the same Rate, and that without cutting the Tops of

the Branches. 10th, We experimented the same in a Sycamore with like Success. Notwithstanding, when I get a favourable Day, I intend, with all Diligence and Exactness, to repeat the same Experiment. I am sorry any Letter of yours should miscarry, being fraught always with good Notions and Experiments. I long to know what Plant it was you enclosed, and where, in *Aristotle*, I might find what you mention and quote out of *him*. I have not yet tried those *Juli*, which, you write, so fiercely strike the Nose with a fiery and acid Scent: I hope you will proceed to make farther Experiments with them. As for the Book of *Proverbs*, I esteem it a Toy and Trifle, not worth the owning: Besides, there are many Proverbs of my own Knowledge, partly through Incogitancy, and partly in transcribing omitted; many out of their due Place and Order, and some that want explaining. If your Lady think it worth her Perusal, and can be content to bestow upon it some Shreds of spare Time, the Author takes that Esteem of it to proceed from her Partiality to her Husband's Friend, rather than the Merit of the Work. However, I pray present my very humble Service to her, and tell her, I wish that I had something to present her might be worthy her Acceptance. Those Experiments of Dr. *Hulse* and Mr. *Fisher* about the acid Juice of Pismires, I my self sent to Mr. *Oldenburgh*, to be communicated to the Royal Society.

*Dr. Lister to Mr. Ray.**Dear Friend,**York, March 21. 1670.*

YOU have most ingeniously given the Reason of that Experiment I sent Mr. *Oldenburgh*, concerning the not Bleeding of entire Twigs, which I
did

did after find to be the Air only ; the Posture I held them in, that hinder'd their bleeding : For if I cut a Twig with my Pen-knife, and held it up a while, and then perpendicularly, it would not bleed ; yet if it were then topped, it would, in some time, shew Moisture, yet not always ; but the Bough from whence it was taken did constantly bleed, and that immediately, in case it was at a Bleeding Time. And here I must observe to you one Circumstance, that the Trees I wounded at *Nottingham* did bleed from the same Wounds 5 Months together ; but then these Wounds were next a Brick Wall, and not exposed to the Air : On the contrary, the Trees I wounded here the Beginning of *November* have never bled from those Wounds then made, but from fresh ones many times : And this Neglect in not making new Wounds certainly was the Reason of the Difference, or not bleeding of these *York-Trees*, when yours did in *Autumn*.

Feb. 21. I made many Experiments upon Trees, by bringing them to the Fire-side, and did discover many Phænomena, of which you will have an Account from Mr. *Oldenburgh*. I made them in order to some Queries I sent him formerly, and especially while Saps may not be found at all Seasons of the Year, in a much like Quantity and Consistence, ***** part of a Plant, &c.

The Place in *Aristotle* is *Hist. Anim. lib. 9. c. 39.* *Aranei statim cum editi sunt, fila mittunt, non intrinsecus tanquam excrementum, ut Democritus ait, sed extrinsecus de suo corpore veluti corticem, aut more eorum quæ suos villos ejaculantur, ut Hystrices.* Concerning which Passage, I pray see *Redi*, p. 170, and give me your Opinion how you understand the Greek Text : This Interpretation is *Gaza's*. I will also transcribe for you *Pliny* upon the Place, *lib. 11. c. 24.* *Orditur telas, tantiq; operis materie uterus ipsius sufficit ; sive ita corrupta alvi natura stato tempore (ut Democrito placet ;)*

placet;) *sive est quædam intus lanigera fertilitas.* My Sense I have set down among the Queries I sent Mr. Oldenburgh. Here is a fair Hint for the darting of Threads, if it be not absolutely so to be understood; but for their failing and mounting up into the Air, as yet I find the Ancients were silent, and I think I was the first who acquainted you with it; but that is best known to your self, and I challenge it only by way of Emulation, not Envy, there being nothing more likely, than that several Persons following the same Studies, may many of them light upon one and the same Observation. I am no *Arcana* Man, and methinks I would have every body free and communicative, that we may (if possible, considering the Shortness of our Lives) participate with Posterity.

Mr. Ray's Answer to Dr. Lister's last.

Most dear Friend,

Middleton, April 13. 1671.

SINCE the Receipt of your last, I have fallen into a Feverish Distemper, which is now turned to the *Yellow Jaundice*; a Disease wherewith I was never before acquainted. It has not proceeded to any great Height, and hath render'd me rather indispos'd and listless, than sick. I hope it is now leaving of me. This hath taken me quite off making any farther Experiments upon Trees: But yet I must acquaint you, that upon careful and exact Trial made in Branches of Walnut, Birch, Sycamore, and Willow, cut off, and held perpendicularly the cut End downwards, we found that they would all bleed entire as they were, without topping the Twigs at all; neither could we find that topping of them did sensibly promote their Bleeding. As for Willow, we
observed,

observed, that the young Shoots being cut clear off, and held perpendicularly as before, would drop, tho' from an Incision made in the Branch where it was cut off, it would not bleed. The Place of *Aristotle* I have not yet look'd out in the *Greek*, nor consider'd. I think something might have been gathered from it to that Purpose you speak of, if any one had diligently heeded and weighed it; but I doubt whether your *self*, or Dr. *Hulse*, had any Hint from it. The *fly-ing* or *sailing* of *Spiders* through the Air, is, for ought I know, your Discovery: From *you* I had the first Intimation and Knowledge of it. Dr. *Hulse* acquainted me with no more than the *shooting out their Threads*. I would not be so injurious to any Man, especially to so esteem'd a Friend, as to rob him of any part of the Reward of his ingenious Endeavours, and transfer to another what is due to him; tho' it be as much Commendation to find out a thing by ones own Industry, which hath been already discovered by another, as to invent it first; this last being rather a Happiness than any thing else, tho' I know the World will hardly be induced to believe that two Men should hit upon the same Discovery at the same time. You do well, in my Judgment, to be free and communicative of your Notions and Inventions: Treasuring up Secrets being an Argument to me of a disingenuous Spirit, or of a weak Stock in them that seek to get or uphold their Fame thereby. Those Secrets too, for the most part, when discovered proving to be Things of no great Value. If it please God I get well, I intend this Week a Journey into *Essex*. Your Experiments made upon Trees brought to the Fire, I have as yet heard nothing of from Mr. *Oldenburgh*. *****

Mr.

Sir Philip Skippon to Mr. Ray.

S I R,

I Should have sent you the last Week the enclos'd Particulars which *Willisell* desires you to take Notice of. The one is, as he says, a *Salix* n. d. that casts its outward Bark, and stands naked: It hath a remarkable *Iulus*. It grows near the small Brook that runs into that River nigh *Darking* in *Surry*. The other is, as he would have it call'd, *Veronica Spec. Paronychia fol. Rut. facie*. It grows at *Rowtam* in *Norfolk*, betwixt the Town and the Highway, 12 Miles before you come to *Norwich*; and at *Mewell* in *Suffolk*, betwixt the two Wind-Mills and the Warren-Lodge in a Wheat-Ground, on the Right Hand of *Lynn-Road*; and in Gravel-Pits, 2 Miles beyond *Barton-Mills*, on the Ridge of the Hill, where a small Cart-way crosseth the Road to *Lynn*. It grows also in the Grass thereabout very plentifully nigh the latter End of *April*. Of these two I have sent Samples.

He hath discovered *Helleborine flo. albo* to grow a Mile on this Side *Green-Hithe*, in a Valley near a Church, and in the Beech Wood nigh *Darking*: He hath also found *Absinth. Inod.* a Mile from *Barton-Mills*, where a small Stone standeth in the Road to *Lynn* for to guide Passengers; and in their Furz-Bushes under the Hill plentifully, and on the Road to *Norwich*, before you come to a Town call'd *Elden*, where a great Road from *Lynn* into the Countrey crosseth *Norwich Road*, and in the Way on the other Side of *Elden*, as you go up that Hill towards *Norwich*.

Mr.

Mr. Ray to Dr. Lister.

Middleton, June 28. 1671.

Dear and honoured Friend,

FOR my part, I am, God be thanked, in good Health. The *Faundice*, which seized me here this Spring, by sticking to one Medicine for 4 or 5 Days (that was an Infusion of Stone-horse Dung with Saffron in Ale) I got pretty well rid of before I began my Journey, as I think I formerly acquainted you. I believe any other Medicine, (of which for that Disease there are good Store) if I had been constant to the Use of it for some time, would have wrought the same Effect. One thing I cannot but wonder at in that Disease, that many astringent Things, as *Plantain-Water*, &c. should be good for it. I am glad that you have been prevailed with to communicate your Observations and Discoveries to the Publick. I remember you formerly acquainted me by Letter, that you had found out an Insect which yielded a Purple Tincture; but I did not then suspect it to be any thing a-kin to the *Kermes* kind. I have not yet found those Membranous Husks you mention sticking to Rose-tree Twigs; indeed I have not searched for them. I had thought that the *Kermes-berry* had been a Blister of the Bark of the Oak, and not a thing merely contiguous, or adhering, as a *Pastella* to a Rock. I am sure the Matrices of many Insects bred on the Leaves and Branches of Trees are Excrescences of the Plant it self; howbeit I will not say but that they might be first caused or raised by the Mother Insect wounding the Bark or Leaf, either by Puncture, or distilling thereon some virulent Juice. Mr. Oldenburgh hath written to me for

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98 *Sir Philip Skippon to Mr. Ray.*

a Sight of your Letter; wherein you give an Account of your Opinion concerning vegetable Excrecences: But truly all my Letters which I had here, I bound up in Bundles and sent away into *Essex* this Spring, and cannot, without some Trouble, recover that Particular. I desire, therefore, that you your self would give him Satisfaction, and write your Thoughts upon that Subject again. Your *Cimex* feeding upon *Henbane* I have observed, but not his Eggs as yet: I cannot but wonder at your Cunning and Luckiness in observing and finding these Things. I intend (God willing) on *Monday* next, to begin a Simpling Voyage into the North, taking *Thomas Willisel* along with me, and to go over and view particularly my self, those Plants which he hath discovered there, by me not observed, wild with us. In my Return, if *York* lie not too much out of our Road, I may chance wait upon you; till when, I shall desire what farther I have to enquire of you, or communicate to you.

Sir Philip Skippon to Mr. Ray.

S I R,

Sept. 18. 1671.

I Have enclos'd the best Account I can yet make of *Herring-Fishing*, and shall hint some Proverbs that I think are omitted in your Book, viz.

One Renegado is worse than two Turks:

A Scot, a Rat, and a Yarmouth Herring, go all the World over.

He is a Hot-Shot in a Mustard-pot, when both his Heels stand right up.

The Brother had rather see the Sister rich, than make her so.

They

Sir Philip Skippon to Mr. Ray. 99

They go far that never turn.

The more Cost, the more Worship.

I have dined as well as my Lord-Mayor.

*It would make a Man scratch where it does not itch,
to see a Man live poor to die rich.*

Free of her Lips, free of her Hips.

*When Fern begins to grow red, then Milk is good
with Brown-Bread.*

Liquorish Tongue, Liquorish Tail.

*If it rain on Sunday before Mefs,
Every Day of the Week more or less.*

I believe I shall somewhat surprize you with what I have seen in a little Boy, *Will. Wotton*, 5 Years old the last Month, the Son of Mr. *Wotton*, Minister of this Parish, who hath instructed this Child within the last three Quarters of a Year in the reading of the *Latin*, *Greek*, and *Hebrew* Languages, which he can read almost as well as *English*; and that Tongue he could read at 4 Years and 3 Months old as well as most Lads twice his Age. I could send you many Particulars about his rendring Chapters and Psalms out of the 3 learned Languages into *English*, and his admirable Memory, which 'tis hoped will be attended with as good a Judgment and Understanding. His Father, I believe, will signify hereafter the great Proficiency of his Child, so much admir'd by every one that knows what he can already perform.

Dr. Lister to Mr. Ray.

Dear S I R,

York, Oct. 25. 1671.

I Confess to you that I am not at all satisfied with the Account of Vegetable Excrecences, because I was not able to attain the End, and give any clear Light to the Question. Moreover, upon Review, I see,

That the last Proposition is ill expressed ; that the Substance or *fibrous Part* of *many Vegetable Excrescences* not to be the Food of the *Worms* to be found in them ; my Meaning is, that the *Worms* in those *Vegetable Excrescences* which produce *Ichneumones*, (to which kind of Insect we would limit this Proposition, and expung all other Instances.) These Worms, I say, do not seem to devour the Substance or fibrous Part of them, as other Worms devour the Kernels of Nuts, &c. but that (whatever their Manner of feeding is, and we doubt not but they are nourished in and from them) the *Vegetable Excrescences* still mightily increase in Bulk, and rise as the Worms feed.

It is observable (if we would endeavour a Solution) that some of the *Ichneumones* delight to feed upon a liquid Matter, as the Eggs of Spiders, the Juices (if not Eggs) within the Bodies of young Caterpillars and Maggots ; whence we conjecture, that those of the same Genus, to be found in *Vegetable Excrescences*, may in like manner suck in the Juices of the equivalent Parts of Vegetables.

And this the dry and spongy Texture of some of these kinds of Excrescences seems to evince : For if you cut in Pieces a wild Poppy-head for Example (or the great Balls of the Oak) you will find in those Partitions, wherein these Worms are lodg'd, nothing but a pithy Substance, like that of young Elder ; and if there chance to be any Cells unseiz'd (which I have sometimes observed) the Seeds therein will be found yet entire and perfect. Whence very probably they feed upon, or suck in by little and little the yet liquid Pulp of the tender Seeds, and leave the Substance or fibrous Parts of the Seeds entire ; which Fibres are, as the intermediate Juice is exhausted, monstrously expanded into an Excrescence by the yet vegetative Power of the Plant.

As for Matter of Fact to clear the Truth of that Opinion, that the diverse Races of *Ichneumones* are generated

generated by their respective animal Parents; and particularly that those which the various Excreescences of Vegetables produce are not plantigenous: I am in great Hopes the Instance of *Poppy-heads* swollen into *Excreescences*, will favour us the next Season. My Expectation is chiefly grounded upon the Condition and Nature of that Plant, which is such, that nothing can pierce the Skin of it, and wound it, but it must necessarily leave a Mark of its Entry, the milky Juice springing upon the lightest Touch, and drying or concreting suddenly into a red Scarr. And this I think I may affirm, that of the many Heads grown into Excreescences which I gathered this Summer, all had these Marks upon them: But our Aim is here only to make way for the Observation against the next Season. To which Purpose also we propose the following Queries.

1. Whether the shagged Balls of the *wild Rose* are not Excreescences from the Bud and very Fruit of the Plant, like as the wild *Poppy-heads* are apparently not design'd for Worms, but Seed?

2. Whether the large soft *Balls* of the *Oak* are not in like Manner, the Buds of the *Oak* seiz'd about the latter End of *April*, or the very Beginning of *May*; that is, whether they be not the future *Acorn*, or *Acorns*, with all the Parts of a sprouting Branch thus monstrously perverted from the first Intent and Design of Nature.

3. Upon what Parts or Juices the *Ichneumones* *Worms* thrust into Caterpillars, or Maggots, can be thought to feed, and whether there be actually Eggs in Caterpillars sufficient to serve them for Food.

Sir

Sir Philip Skippon to Mr. Ray.

IF this finds you at *Chester*, be pleased to tender my humble Service to his Lordship; and if you meet there with any *Irish* Pieces of Money, I desire your Kindness to purchase some for me. I am very desirous to find those *Elizabeth*, or *Pudsey* Shillings, *Webster* mentions in his History of Metals, pag. 21. that were made of Silver Ore in *Yorkshire*; he says they are marked with a *Scallop*: As you happen upon any of them, lay one or two aside for me, and I shall be obliged to you. I cannot yet send you the *Inscriptions* concerning the 365 Children, and Sir Jo. Mandevil; but in lieu of them shall send you an humorous *Rhythming Will* of one *Moore*, who died not long since about *Mersbland* in *Norfolk*, and gave his Estate to his Grand-daughter, now married to one Mr. *Shelton*, a Gentleman of this Countrey, that hath a good Estate near *Bury*.

In the Name of God Amen. I Thomas Moore the 4th Year of my Age above threescore, revoking all the Wills I made before, making this my last and first. I do implore Almighty God into his Hands to take my Soul, which not alone himself did make, but did redeem it with the precious Blood of his dear Son; that Title still holds good. I next bequeath my Body to the Dust, from whence it came, which is most just; desiring yet that I be laid close by my eldest Daughter, tho' I know not why. I leave my Grandchild, Martha, her full Due, my Lands, and all my Cattle, save a few,

*you shall hereafter in this Schedule find
to Piety or Charity design'd,
whom I my sole Executrix invest,
to pay my Debts, and so take all the rest :
But since that she is under Age, I pray
Sir Edward Walpole, and her Father, may
the Supervisors be of this my Will,
provided that my Cousin Colvil still
and Major Spensly her Assistants be ;
four honest Men are more than two or three.
Then I shall not care how soon I die,
if they'll accept it, and I'll tell you why.
There's not a Man of them but is so just,
with whom almost my Soul I dare to trust.
Provided she do make her Son
Heir to my House at least, and half my Land.
If she hath such, and when she hath so done,
she be a Means to let him understand
it is my Will his Name be written thus,
T. A. B. C. or D. Moore alius.*

E P I T A P H.

*Here lies in this cold Monument,
as appears by his last Will and Testament.
He was very rich, his Name was Moore ;
who ever knew Poet die rich before ?
But to speak Truth, his Verses do shew it.
He liv'd a rich Man, but dy'd a poor Poet.*

Mr. Jessop to Mr. Ray.

S I R,

December 18. —71.

I Shewed Mr. John Fisher your Letter yesterday,
his Brother not being at home, when I went to
visit them. He gives you many Thanks for your Ac-
count

count you gave him of young *Helmont*. He gives this Account of their *Menstruum*, of which you enquir'd. The Experiment was made accidentally; for having kept it in a Glass Vial, (part of the Relicks of which he shewed me) and going to take out some for their Use, they found that it was all run out, and yet they could observe neither Crack nor Hole in the Glass: Yet observing that the Glass was very white as far as it had been filled, he not imagining what might be the Reason, endeavoured to cleanse it with an Iron prepared for that Purpose: But the Glass proved so tender, that at the first Touch the Iron made a Hole through it. Upon this they began to consider what might be the Reason of this Accident, for they had often made the same Preparation, and yet not met with this Effect. At length they remember'd that they had by chance used a stronger Fire than they did formerly; and therefore, upon the next Occasion, after they had drawn part of it with their usual Degree of Heat, towards the latter End they urged it with a stronger Fire, and found, according to their Expectation, that what was drawn first did not *dissolve Glass*, but the latter did. This Experiment they have made four times with Success, and without failing at any time. They shewed me about a Pint of their last Extraction in a thick green Glass Bottle, and it seemeth to have dissolved it about half way through. He seems to make a Doubt of the Meaning of those Words in your *Quære* (whether the *Menstruum* dissolve Glass constantly and certainly;) if you mean, as I imagine you do, you have your Answer already.

But if you ask whether the same Portion of the *Menstruum*, which hath formerly *dissolved Glass*, will again do the same with the same Vigour? He answers, that in this Particular it doth not differ from other ordinary *Menstruum's*; for at the second time it works its Effect more weakly, and the third time
scarce

scarce discernibly, as he hath observed. If after this Account Mr. Boyle think this a Matter worth his Consideration, he may absolutely command Mr. Fisher in this Particular, or any other, without any Conditions or Reservations, as he may do all that Part of the World which pretends to Ingenuity and Gratitude: And yet Mr. Fisher would esteem it an exceeding great Honour if he would condescend so much as to instruct him in any thing. I thought it convenient to let you know, that altho' the Account I gave you of *drawing Spirit of Wine out of Vinegar* was all that either you or I receiv'd from Mr. Fisher, yet he tells me, that it is not the best way, (and saith he told you as much) nor the way that he useth; which for several Reasons he yet keeps as a Secret. He is busy at present about improving an Experiment he hath lately made of *turning the whole Substance of Vinegar into an urinous Spirit*. He let me see about half a Pint that he had already done, which both for Taste and Smell was like a middle Sort of *Spirit of Hartshorn*: He is endeavouring to turn the whole Substance of Vinegar into Spirit of Wine, and saith he hath Hopes of good Success. I should be very glad to see you here in your Return from Chester.

Sir Philip Skippon to Mr. Ray.

S I R,

Wrentham, Feb. 10. 1672.

SOME Particulars I lately met with I shall here insert.

The N. Side of Trees is distinguishable by Quantity of thick Moss growing there. Lederer's Disc. of N. America, p. 24.

106 *Sir Philip Skippon to Mr. Ray.*

In some of the late Transactions, viz. N. 71, 74, 76. are Observables which I doubt not you have taken notice of.

Specificâ proprietate, Maniæ resistere creditur Radix Nymph. lut. quæ mense Majo effossa, &c. Sennertus.

Folia Buxi, & decoctum Anagallid. flo. purp. Maniam curant. idem.

In Mr. Boyle's last Piece of the *Usefulness of Natural Philosophy*, he tells you several Ways to take the Shape of a Leaf, which he recommends to Travellers. In a little Book call'd *Polygraphice*, c. 12. is another Way, viz. First take the Leaf, and gently bruise the Ribs and Veins on the Back-side of it; afterwards wet it with Linseed-Oil, and then press it hard upon a piece of clean white Paper; and so you shall have the perfect Figure of the Leaf.

As any thing else occurs which may be worthy your Knowledge, I shall give you Information. Some Remarks about Insects in the Philosophical Transactions bring to my Memory what I read in *New-England's Memorial 1633*. *Plymouth was visited with an infectious Fever. The Spring before this Sickness, there was a numerous Company of Flies, which were like, for Bigness, unto Wasps, or Humble-Bees; they came out of little Holes in the Ground, and did eat up green Things, and made such a constant yelling Noise, as made all the Woods ring of them, Pag. 90.*

Mr. Ray to Dr. Lister.

Dear S I R,

Middleton, March 2. 1671.

I Thank you for the Account you sent of the *Bret* and *Turbut*. By what you write of the *Bret* I perceive, that what they call *Bret* in *Lincolnshire* and *Yorkshire*, and I believe also in all the East Part of *England*,

gland, is the *Turbut* of the *West-Countrey*, where the Name *Bret* is not known: And I believe the *Halibut* of the West is the Northern and Eastern *Turbut*. And I would fain know how your *Halibut* and *Turbut* differ; for if there be another Fish of the Make and Bigness of your *Turbut*, it is a Stranger to me. Our common Dictionaries english *Rhombus* a *Turbut*: But your *Bret* answers better the Figure so called than your *Turbut* doth.

I am of your Opinion, that the *Bret* is the *Rhombus asper*; but what manner of Fish that is you call *Sandscreiter* I know not. Of this Sort of *Flat Fishes* I have as yet seen only seven Species, but doubt not that there are many more. Those are the *Sole*, the *Pole*, which is a kind of *Sole*; the *Halibut*, which you call *Turbut*; the *Turbut*, which you call *Bret*; the common *Plaïse*, or *Passer lævis vulgaris maculatus*, the *Fluke*, or *Flounder*, called by some *Passer non maculatus*, and by others, I believe, *Rhombus Fluviatilis*; and the *Passer asper sive squamosus* of *Rondel*, called a *Dab* in *Cornwall*. We were told there of some others, viz. one they call a *Lantern Fish*, another they call a *Queen*: But of these Things I hope to receive more full and particular Satisfaction from you. As for what you have published in Print, I judge it worthy of you, and think you deserve much Thanks and Commendation for so frankly communicating your ingenious Observations and useful Discoveries to the World, and will, doubtless, be recompensed with the Honour due to you therefore. In one thing I am as yet of a different Opinion from you, and that is the Origine of those Stones which we usually call *petrified Shells*, tho' you want not good Ground for what you assert.

Mr. Johnson to Mr. Ray.

Brignall, near Great Bridge, March 29. —72.

Honoured S I R,

YOU have the Head of a *Field-fare* almost white; the rest of the Body was not at all altered; whether it be *lufus naturæ*, old Age, or some accidental Cause, I know not. I have only observed this Change from proper Colours to white in *Larks* which are about *Carlisle*, to be very usual in *Titlarks*, which I have seen on our *Moores*: In *Crows*, whereof there is one just now in *Cliffe-Wood*, near *Peirce-Bridge*: In *Daws*, whereof, this Year, one was at *Hurworth*, near *Croft-Bridge*, which was altogether white, Neb, Nails and all: And in *Sparrows*, which is usual. I have sent you the little *yellow Bird* you called *Regulus non-cristatus*, what Bird it is I know not; (*) but we have great Store of them each Morning about Sun-rise, and many times a day; besides she mounts the highest Branch in the Bush; and there with Bill erect, and Wing hovering, she sends forth a sibilous Noise like that of the *Grashopper*, but much shriller.

'Tis like enough our *Whitethroat* is of the *Ficedulæ*; for it is her Manner with us to fall upon a fair and ripe Cherry, whose Skin when she hath broken, with a Chirp she invites her young Brood, who devour it in a Moment.

(*) Doubtless this Bird was the *Locustella*, in Willughb. Ornith. Book 2. Ch. 2. §. 5. and not the *Regulus non cristatus*, Ch. 12. which I call the *Yellow Wren*, and of which I have discovered three distinct Species; but not one of them that sings as is here described, and as I have seen two Sorts (if I mistake not) of *Locustellæ* Birds do. W. D.

Dr.

Dr. Lister to Mr. Ray.

Dear S I R,

I Shall tell you only, that *Kermes* is this Year a greater Puzzle to me than I expected it would have proved. For I observe, 1. That these are soft in the early Spring, and very pulpy. 2. That not only that which I took to be the Excrement of the Bees, but also the *Liquamen* itself, which I took to be Provision of *Bee-Meat*, is nothing else but an infinite Number of small Eggs, out of which a certain sort of *Mites* (as I take them to be) are hatch'd. 3. That these *Kermes* seem to be of different Sorts; some having red, or Carnation colour'd Mites in them, wrapped up in a pure white Silk; others are white of Colour, &c. 4. That not only the Bee Maggots I describ'd the last Year have been found in these *Kermes*, but as Dr. *Johnson* of *Pomfret* assures me, he found in one *Kermes* one large Maggot filling all the Husk.

I desire to know what you and Mr. *Willughby* have farther observed on this Subject.

Mr. Oldenburgh's Letter.

S I R,

London, July 6. 1672.

AFTER my long Silence, I must now put you in mind of some Particulars which were recommended to you and Mr. *Ray* when you were with us here. One was to communicate what you had observed concerning the *Vermis Setaceus*, or *Hair-worm*; of which Mr. *Lister* had made so rational a Narrative

Narrative already. Another, to experiment, to what Degree of Magnitude a *Maggot* may be advanced, by continuing to give it new Flesh every 2 or 3 Days, upon the Occasion of Sir *Sam. Tuke's* Relation of a *Maggot*, which, within 2 Months, by that way, increased to the Bigness of a Man's Thigh. A third, to try whether Insects will be bred in a *Beef's Bladder* so close that no Passage be left for any Fly-blows? And because *Flies* may be said to have blown on the outside of the Bladder, and the *Fly-blows* to have eaten through the Bladder, it will be proper to include such a Bladder in a Case, to defend it from *Fly-blows* outwardly as well as inwardly. A fourth, to try, if Occasion serveth, the Virtue of *Lichen cinereus terrestris*, which was said to be exceedingly efficacious in curing *Dogs bitten by Mad Dogs*. A Fifth, to enquire of Mr. *Fisher* whether he be Master of the Experiment of *dissolving Glass*, and reducing it into a *white Calx*; and after the Glass is well moisten'd with the *Menstruum*, whether it be capable to be shaved with a Knife, almost like Horn? And farther, whether the *Menstruum* employ'd for that Purpose performs upon all Sorts of Glass?

I intreat you, Sir, to present Mr. *Ray* with my hearty Service; and, he being concern'd in some of these Particulars, to give him the reading of this Paper.

Dr. *Grew* is now amongst us at *Arundel-House*, making now and then very good Observations upon Plants: And having shew'd to the Company, among divers Particulars, the *Tracheæ* mention'd by *Malpighi* in his Discourse of Vegetables that you have seen.

He hath been desired to endeavour whether he can discover any such thing as a *Peristaltick Motion in Plants* when growing? For which Purpose he hath been directed to chuse some of the bigger Sort, where-

Mr. Oldenburgh's Letter. III

in that Motion, if there be any such, is like to be more discernible.

We hope, Sir, that you and your Friend will join in making a Research so considerable.

I presume you know, that Mr. Keyle's *Essay* of the Origine and Virtues of Gems is now abroad. And I believe, that Seignior *Malpighi's* Discourse *de formatione pulli in ovo fecundo, tam non incubato quàm incubato*, will be printed in a short time. I desire very much to know that these Lines are come to hand.

Mr. Johnson to Mr. Ray.

Honoured SIR,

I Saw near *Kendall* (to my great Wonder) a *Broom-Tree* (if I may so say) 4 or 5 Yards high, much thicker than my Leg, spreading large Branches every way, adorned with large fair Flowers, a very fair Spectacle. I found at *Haughton*, in the *Bishoprick*, your *Varietas altera Jaceæ nigræ*, with the Flower all white, a very pretty Plant, worthy a Garden.

Brignall, August 5. —72.

Dr. Lister to Mr. Ray.

S I R,

York, October 12. 1672.

August 18 I passed through *Marton Woods*, under *Pimco-Moore*, in *Craven*. In these Woods I then found very great Plenty of *Mushromes*, and many of them then wither'd, and Coal-black; but others new sprung and flourishing: They are some of them of a large Size, and yet few much bigger than

than the *Champignon*, or ordinary red-gilled eatable *Mushrome*, and very much of the Shape of that; that is an exactly round Cap, or Crown, which is thick in Flesh, and open deep Gills underneath; a fleshy, and not hollow, round Foot-Stalk, of about 6 Fingers breadth above Ground, and ordinarily as thick as my Thumb: The Foot-Stalk, Gills, and Cap, all of a Milk-white Colour. If you cut any part of this *Mushrome*, it will bleed exceeding freely and plentifully a pure white Juice. Concerning which, note,

1. That the youngest did drop much more plentifully and freely than those that were at their full Growth, and Expansion: That the dried and withered ones had no Signs of Milk in them that I then discern'd.

2. That this Milk tastes and smells like Pepper, and is much hotter upon the Tongue.

3. That it is not clammy or roapy to the Touch.

4. That altho' I used the same Knife to cut a hundred of them, yet I could not perceive, all that time, that the Milk changed Colour (as is usual with most vegetable Milks) upon the Knife Blade.

5. That it became in the Glass Viol, I drew it into, suddenly concrete and stiff, and in some Days dried into a firm Cake, or Lump, without any *Serum* at all.

6. That it then also, when dried, retained its keen biting Taste, as it does at this Day, yet not so fierce: Its Colour is now of a yellowish green, yet very pale.

7. This Milk flows much faster from about the outmost Rimm, or Part equivalent to the Bark of Plants, than from the more inward Parts, &c.

8. I observed these *Mushromes* even then, when they abounded with Milk, (not to be endured upon our Tongues) to be exceeding full of *Fly-Maggots*; and the youngest and tenderest of them were very much eaten by the *small-grey-naked* Snail.

You

You can tell me what Author describes this *Mush-rome*, and what he titles it.

I have revised the *History of Spiders*, and added this Summer's Notes. Also I have likewise brought into the same Method the *Land and fresh Water Snails*, having this Year added many Species found in these Northern Lakes. And by way of Appendix I have describ'd all the *Shell-Stones* that I have any where found in *England*, having purposely viewed some Places in *Yorkshire*, where there are Plenty. The Tables of both I purpose to send you. I am not so thoroughly stocked with Sea-Shells as I wish and endeavour. I aim not at Exoticks, but those of our own Shires. Concerning *St. Cuthbert's Beads*, I find 3 Species of them in *Craven*; and this makes it plain, that they have not been the Back-bone of any Creature, because I find of them ramous and branched like Trees.

Mr. Jessop to Mr. Ray.

S I R,

I Received both yours, and am very glad to hear of your Design of reviewing Mr. *Willughby's* Collections; and I shall give what Assistance I can in the Business concerning *Hawks*. In the mean time you may peruse *Latham's Falconry*, whose Descriptions are true; tho' not perhaps so full as you may expect. There are, besides these that are mentioned in the common Books, a *Boccarell*, and a *Boccaret*; the which, altho' I have often seen, yet I did not observe them so well, as to be able to describe them exactly. They are the Names of the Male and Female. A *Boccarell* I once kept my self, which was much larger than either the *Lanner* or *Falcon*; and yet the

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common

common Tradition is, that they are a *Bastard Hawk* bred betwixt a *Lanner* and a *Falcon*; how true I know not.

March 14. —72.

Mr. Jessop's Paper.

My Man William's Way of making Hard Soap.

TAKE Wood-Ashes, and Ashes of Nettles, or Thistles, (for Fern-Ashes make the Soap soft) as much as you please: Put unto them a third Part of Lime; make a Hole in the Ashes, and lay the Lime in the middle of the Ashes, and quench it with Water, or small Ley; then cover it with the Ashes that lie round it close, so let it lie for half a Quarter of an Hour, or thereabouts, till you think the Lime be fallen. With a Shovel mix them well together, having your Fat, or Tub, ready, for fear they lose their Virtue. Let your Fat, or Tub, have a Hole in the Bottom; cover it with a Slate-Stone, or Board, laid upon other little Stones, which may keep it about an Inch from the Bottom of the Tub: And over the Slate-Stone, or Board, lay Straw, to keep the Ashes from the Hole. Fill the Tub almost full with the Ashes and Lime mix'd as above, and press them down pretty hard; lay a Wisp of Straw on the Top of the Ashes in the Middle of the Fat, to keep the Water from making a Hole: Pour on a little Water upon the Wisp at first, so as it may spread in the Ashes about a Hand Breadth about the Wisp; then pour on more than at the first, as soon as the first is drunk up by the Ashes. And at the next time you may pour so much as will spread over all the Tub: And if it take that without breaking the Ashes, you may pour on more. If that Ley which comes thro' the Hole into your Receiver at the first be not clear,

put

put it up again, and so long continue pouring on Water as the Ley in the Receiver will bear an Egg. And this they call strong Ley.

Keep this by it self, and pour on cold Water again; and the next will be middle Ley, which you must know by its Taste. The last will be small Ley, prepared after the same Manner, which hath scarce any Taste at all.

Take next a hundred Weight of Tallow, put it into the Copper: Put about six Gallons of middle Ley unto it; then put Fire under the Furnace, and melt it down in the Ley, but so as it do not boil: Draw the Fire from under it, and let it stand for four or five Hours; then warm it again, and put in three or four Gallons of strong Ley, and so let it cool again four or five Hours. Warm it again, and, if need require, put in more Ley, which you will know by the Sharpness of the Taste of the Soap: If it be pretty strong, let it boil until it become like a Jelly. When it is ready for graining, if you dip your Knife into it, and take out some, and let it cool, it will rowl about your Knife.

To grain it, or separate the Ley from the Soap, put in a Peck of Bay-Salt; then keep a Fire only upon one Side of your Copper, so that it may boil only on that Side where the Fire is; after it hath boiled a little, take out some of the Ley, and look whether the Tallow be clearly separated; if not, you must put in more Salt. It must boil till all the Froth, which will rise at first a great Height, be wholly fallen: Then take the Soap out of the Ley with a Scummer, and put it into a Chest with a Sheet under.

Take an Ounce of Indico, beat it to Powder, put it unto a Pottle of middle Ley in a little Pan, and put unto it some hot Soap out of the Copper, so as to make it pretty thick; let it boil: And being hot, pour this into the middle of the Soap in the Chest. Whilst it is

hot, stir it up and down with a Stick very well, and it will make blue Veins in the Soap.

When it grows cold, they cut it into square Cakes with Wires.

Dr. Lister to Mr. Ray.

Dear SIR,

York, June 20. —73.

I Am very joyful at the News you give me of your Thoughts of publishing the *Natural History* design'd by Mr. *Willughby*. I am very sensible of the great Pains it will ask to perfect any one Part of it. I only beg of you, that you will let one part see the Light before you undertake the next, and that they may not stay one of another. My Notes are very slender upon the Subject of Birds.

I have very little Time to bestow upon Natural History; yet what Pleasure I give my self, is to divert my self that way. I have been at *Bugthorp* since I last writ to you, to view the Place of *Petrified Shells*. I shall not trouble you at present with any of my Observations made there, save, that I found some *Star-Stones* branched, as I had found formerly *St. Cuthbert's Beads* in *Craven*.

This Year has much changed my Thoughts concerning *Kermes*. I have found them upon *old Ropes* and *Deal Boards*. I am pretty confident that it is an *Animal* of the *Multipede* Kind, which does fix it self in order to the laying of its Eggs; and that the Eggs are laid and fasten'd about its Belly, just as the Eggs of a Cray-fish are under her Tail. I have taken the Animals before the fixing of themselves; but shall tell more of this e're long.

For other Discoveries and Experiments, I refer you to a late Letter I wrote to Mr. *Oldenburgh*, which he threaten'd to print in the next Transactions. When you see it, give me your Opinion freely of the Particulars.

Mr. Dent of Cambridge to Mr. Ray.

S I R,

Cambridge, June 21. 1675.

SINCE my Return I could not meet with any *Thornbacks*, till upon *Friday* last, and then I had a *Male Flairmaid* and a *Female Thornback*. They were so far from assisting me to perfect what I had begun, that they have given me just Occasion of a great deal farther Search, especially the Male, which had between the Fins and the Tail, of each Side, another Tail, as the Fishmonger call'd it, and which (he saith) all the *Males of Flair*, and *Flairmaid*, *Thornback*, and *Thornback-maid*, have. They are not Tails, but such (Creatures I had like to have call'd them) as deserve an excellent Description, and the Art of an excellent Graver. The extreme Part (more than half way) very much resembles an Eel without Eyes; within an Inch of the Fins it grows a little smaller, the outside of each is a *Rima*, from the Extremity to that Part which begins to be smaller. This *Rima* examined and dilated, (which it easily admits of, and afterwards contracts itself) that which was like the Head and Part of the Body of an Eel, seems to be an expanded Webt Foot, with several Remarkables in it, as a Heel, a sharp edg'd Bone half Inch long, &c. These (call'd Tails) seem to me like unshap'd Legs kneed, and join'd with the Bones of the Fins (which may be call'd Thigh Bones) and they

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to the *Coxendix*. In each above the *Rima*, or rather under the Fins, (examining the Muscles, rather than expecting to find any thing) I run my Knife upon a Vessel, which afforded a great Quantity of Liquor, (for that Part) part white, part bloody; which being wip'd off, I found seminal Vessels: Being more careful on the other Side, I found a large Vessel full of Liquor as on the former mention'd Side. What to call this *Bladder*, or *Vessel*, I do not yet determine: *Scrotum* I must not, for that the *Testicles* (very pretty to a curious Eye) are within the *Abdomen*. Whether in or nigh this Vessel, is one of the *Glandulæ Prostatæ*; and whether there are any *Vesiculæ Seminariæ* within these, or any other besides these, I would farther examine. I believe, but dare not assert, that the *Penis* on each Side is annexed to these Vessels: Some Ramifications of the *Epididymis* seem here, but not so plain as in the *Abdomen*. While I was searching for any thing that might be annexed to the *Foramina*, which by *Gesner* are called *Foramina Vulvæ*, (and very cunningly by *Steno* pass'd over in Silence) though they are in all Males as well as Females, I cut with the *Os pubis* so much as hinder'd the Discovery whether both *Penis*'s might meet or not. I am satisfy'd that those *Foramina* serve only to let in Water into the *Abdomen*, as those behind the Eyes let it into the Mouth shut, the 10 Trap-Doors, or Floodgates, of the *Branchiæ* being shut at Pleasure; and this receiving in so much Water, may be (if it be lawful to conjecture) by the Weight of the Water to make her more swift in pursuing Prey (if at all) downward.

Another

*Another Letter of Mr. Dent's to Mr. Ray,
without Date.*

SIR,

I Could not in my last, of the 15th Instant, give you any good Account of the Eggs of *Flair* or *Thornback*, because they were very small then, and only in the *Vitellarium*. Since that I have found a *Female Flair* with two Eggs in Shells in the *Duplex Ovarium*, as Dr. Needham observes in his *Disquisitio Anatomica*, p. 202. The one I dried whole, and have it by me. I opened the other, and found the *Vitellum* to be grown flat, swimming in the *Albumen*, and with moving the Egg upwards or downwards (I mean whilst whole) would easily glide through the *Albumen* to which End I pleased, which is easy to be seen through the Shell between the Light and the Eye. It was pale colour'd, and without any *Cicatricula*, which I do suppose will be found hereafter in others more mature. Mr. Mayfield would persuade me that these Fishes are *vivipari*; for he saith, about a Month or five Weeks hence I shall see the Fish perfectly formed in that Egg-Shell. I doubt he is mistaken; however, I will Weekly observe their several Alterations, and give you a full Account hereafter. The other Eggs (without Shells) in or upon the *Vitellarium*, are all round; the largest about half the Bigness of a Tennis-Ball. I boiled both Parts of them in Water; the *Vitellum* grew solid, like to that of a Hens, but the *Albumen* grew not white like the Hen's Egg; it grew a little more solid, but remained diaphanous. I have enclos'd the Shell, which does not agree with Dr. Needham's Description of his *Testa Ovi*

Ovi Raiaë, he saith, *Ex quatuor angulis totidem lingulae excrescunt*; at one End it hath Excrescences rather to be call'd *Cornuaë* than *Lingulaë*; the other End seems more like a Fin than either. What they may hereafter come to, I know not; but will give you an Account.

Mr. Ray to Dr. Lister.

Dear S I R,

I received your last Letter of *Novemb. 11.* with your accurate Observations about *St. Cuthbert's Beads*. A strange thing it seems to me, that the broken Pieces of those Bodies which you find, I mean of the main Stems, should be of equal Bigness from Top to Bottom, and not at all tapering, if they be indeed the Bodies of *Rock-Plants*. There are found in *Malta* certain Stones called *St. Paul's Bastoons*, which I suppose were originally a Sort of *Rock-Plants*, like small snagged Sticks, but without any Joints; the Trunks whereof diminish, according to the Proportion of other Plants, after the putting forth of their Branches. Those Roots that you have observed, are a good Argument that these Stones were originally Pieces of Vegetables. Wonderful it is, that they should be all broken, and not one Plant found remaining entire; and no less wonderful, that there should not at this Day be found the like Vegetables growing upon the Submarine Rocks, unless we will suppose them to grow at a great Depth under Water. And who knows but there may be such Bodies growing on the Rocks at this Day, and that the Fishers for Coral may find of them, tho', being of no Use, they neglect and cast them away. Certain it is, that there is a Sort of *Corall* jointed. The small Col-
lection

lection of *Local Words* I mentioned to you is abroad. I had sent you one of them, but that I knew not how to get it conveyed, unless I had sent to Mr. *Martin* for Direction: And truly the thing is so inconsiderable a Trifle, that I thought it not worth the While to give him the Trouble. Besides, it is so ill corrected, that I am also in that respect ashamed of it.

I am going on as fast as I can with the *Ornithology*. That the Work may not be defective, I intend to take in all the Kinds I find in Books which Mr. *Willughby* described not, and to have a Figure for all the Descriptions I can procure them for. I have sent this Week to Mr. *Martin* to begin to get some Figures engraved.

Middleton, Novem. 29. —73.

Mr. Johnson to Mr. Ray.

Honoured S I R,

YOU desired a particular Account of the *Barnacles*, which I have given, and am confident they are two Species at the least; yet so near a-kin, that they have all a dark Veil, covering Head and Neck alike, far.)

If you have not yet determin'd what those *Shells* upon old Planks and Ships (which Antiquity fancied to be young Gooslings) are, give me Leave to propound one Conjecture among many, viz. that they are the *Spawn of Shrimps*. 'Twas my Brother *Jo. Johnson's* Observation, who told me, that so far as his naked Eye could discover, there was an exact Proportion of Parts betwixt the Contents of those *Shells* and the *Shrimp*: If this Conjecture have any thing of Probability in it, pray examine it farther; if not,

R

pardon

pardon this Trouble. The conjectural Reasons which I here and there add of the Parts of Fowls, I express positively, to avoid Prolixity of Words; and if in many of them I err, (as like enough I may) it is not for want of ———.

Most of the *Latin* Names I give, are *Jo.* or *Gesn.* for I have not *Aldrovand.* tho' I confess sometimes their Descriptions are imperfect, or do not exactly agree: And sometimes (tho' rarely) I take the Liberty to feign a Name, where I find not one.

'Tis commonly reported with us of the *Heron* and *Bittour*, that they have but one wide Gut; and therefore (they say) when they eat an Eel, she presently goes through them, which the *Heron* in her Flight catches again and again; but when I opened them, I found the Story false, for they had Guts like other Birds for any thing I saw; therefore I rather think the Eel (if at all) makes her Escape out of her Feet.

Brignall, Jan. 15. 167 $\frac{3}{4}$.

I have often taken Notice that the *Summer Birds* do all, or most of them, feed on such Insects, whose being consists most what in Motion, I mean, who have more Store of *Animal Soul* than of all the rest, and therefore afford a plentiful Supply of Animal Spirits to the *Brain*, and *Genus Nervosum* of the Birds; which I sometimes fancy to be the Reason why these Birds are so restless in Motion, and such continual Singers: And perhaps some Reason may be taken from hence why the *Sows*, and some other Insects, are so beneficial to the nervous Kinds, and why a greater Medicinal Improvement may be made of Insects.

Mr.

Mr. Oldenburgh to Mr. Ray.

S I R,

London, July 11. —74.

MY worthy Neighbour, Mr. *Hatton*, giving me a Visit, acquainted me, that my Lord *Mordaunt* hath at his House at *Parsons-Green*, near *London*, some of those *Barbadoes Turtles* that are not bigger than *Larks*, and that his Lordship is willing to permit any Artist that shall come to him in his, Mr. *Hatton's* Name, to take a Draught of that Bird.

If therefore you are minded to have that Bird inserted in your History of Volatils, it not being hitherto described, as Mr. *Hatton* thinks, you may give Order to Mr. *Martin* to send some fit Person to the Place mentioned, to receive that Satisfaction, which I could not omit to give you Notice of.

Mr. Ray to Dr. Lister.

Dear S I R,

IN the last Philosophical Transactions I saw a Table of *Land and Fresh-water Snails* of your drawing up, which is indeed very full, and disposed in an excellent Method, and the lively Figure of each Shell, being elegantly engraven, added; so that there is little wanting to a compleat History of them. I have not been very curious in searching out and noting the Varieties of our *English Land-Snails*: Many of yours I have not taken Notice of. The second Kind I think is that you and I observed about *Montpelier*; but I do not remember to have seen it in *England*.

gland. Of your *Water-Snails* I have discovered most, if not all. Your first *Buccinum*, which is the 18th in the Plate, I use to call *Conchula Persica* for some Resemblance, if I mistake not, it hath to that Shell: It hath also the Likeness of those they call *Porcelaine Shells* beyond Seas, and use for Cosmeticks. I have observed a small Water-Snail in our Brooks, which I use to term *Nerites Fluviatilis* for its Similitude, which I think is not in your Table, unless it be the 18; but then it is not rightly figured; for the Bottom, or *Vertex*, in mine, is round, and not at all produced. I have also observed abundantly in our Brooks a *Patella Fluviatilis* no broader than a *Lentill* sticking to the Stones. But of these Things, being thus by you quickened, I shall hereafter (God granting Life and Health) take more exact Notice. I thank you for your Communications, and exhort you as earnestly as I can to proceed with all Vigour in your Search into the History and Mysteries of Nature: In the Prosecution whereof, the Success you have already had, and Discoveries you have made, have both rewarded your Endeavours, and given you Encouragement to persist.

Mr. Oldenburgh to Mr. Ray.

S I R,

London, Sept. 15. —74.

MY late Absence from *London*, and other Occasions, have kept me from sooner giving you the following Account from Seignior *Boccone*, in Return to the Letter you wrote to him, which, it seems by this his Answer, was without your Name to it. He saith thus in *French*:

L'Autheur

L'Autheur de la lettre latine tesmoigne d' avoir beaucoup de bonté pour moy, & ce ne puis luy respondre dans les formes, à cause que la dite lettre n'est point signée. Je croy pourtant de pouvoir deschiffrer l'autheur, par l'histoire de ses voïages en *Sicile*, & à *Maltbe*, & de m'arrester sur la personne illustre de Monsieur *Rayus*. Je vous prié donc, de luy vouloir rendre mes tres-humbles reconnoissances, & de luy temoigner mes obligations; & que, j'il arrive jamais qu'il revient en *Italie*, je le serviray pour compagnon dans toutes les peines inevitables, qu'on rencontre dans les occasions d'herborizer.

La *vicia sesamacea* qui à esté descrite par *Fab. Columna* differe d'avec la *securi-daca filiquis fabaceis* en beaucoup de parties; sçav. les filiques, que produit la dite *vicia*, sont plus petites, plus aiguës, & (ce qui ést le plus remarquable) attachees au *caulis* sans la mediation sensible du *pediculus*; ce qui n'arrive guere dans les parties dela *securi-daca Sicula*. J'ay trouvé une figure de *vicia sesamacea*, qui à esté tirée avec la mesme plante selon la methode prescrite par *Spigelius* dans son *Isagoge*: Si vous ou M. *Rayus* ferez tirer la figure de la *securi-daca filiquis fabaceis* par la mesme methode, vous connoistrez d'abord par cette espeece de demonstration la difference des parties. Pour le present J'ay l'honneur de vous envoyer le portrait, mais avec le temps ce pourroy vous envoyer la plante mesme, ou ses graines. Il me semble, que J'ay remarque dans les Observations Topographiques quelques Plantes, que J'ay trouveés dans la *Sicile*, sçav. un *Hypericum*, un *Gramen*, une *Jacea*, une *Campanula*, une *Lychnis*, & autres Plantes rares. Je souhaite avoir un exemplaire de cet ouvrage, pour y expliquer, à l'occasion d'une autre impression, que ces Plantes la sont les mesmes avec celles, que M. *Rayus* & moy avons observeés & descrites. Et je dois faire cela pour rendre justice à ce sçavant voïageur, & pour empescher la multiplication des especes, estant les
mesmes

mesmes plantes. J'apprens avec plaisir, que le *Solanum spinosum maxime tomentosum* à esté apporté de la *Virginie* en *Angleterre* la premiere fois, cela m'ayant esté inconnu jusques icy.

So far Seignior *Boccone*. To which I shall add something that may concern the *Ornithology*; which is, That I saw lately 2 or 3 Sorts of *East-Indian* Birds, brought thence with the last Return-Ships; very fine Creatures: And they were, 1. A curious speckled *Indian* Hen. 2. Some *East-Indian* Pigeons, delicately shaped. 3. Some very small Birds, with short Scarlet Beaks, and curiously speckled Feathers, &c. These, if we could learn their Names, and something of their Nature and Qualities, were very well worth, in my Opinion, to be taken into your Book. I hear they are shortly to be brought from *Wapping* (where I saw them in the Company of my Lord *Brouncker*) to *Tower-Hill*; and if they be so, we may then get a Draught of them, if you think fit, for the Engraver, especially if the Person that brought them can give us any tolerable Description of them.

I cannot conclude this, without giving you Notice, that the Council of the Royal Society intends to engage those of the Fellows of that Body, that are able and willing, to give them once a Year, each of them, an Experimental Entertainment at their ordinary Meetings, that is, some good Discourse grounded on Experiments made or to be made; that so their Weekly Meetings may be more considerable and inviting than hitherto they have been, and the Work of the Society not lie altogether on the Shoulders of 3 or 4 of the Fellows. And this being to reach the absent as well as the present, I mean of those that have Opportunity and Ability, I do herewith intimate to you, (as I have lately done to Mr. *Lister*) that you are looked upon as one of those which the said Council have in their Eye for such an Exercise, desiring you that
you

you would think upon such a Subject as your self shall judge proper for one Entertainment of that Company after our Anniversary Election-Day the next Year: And if your Occasions should not permit you to step to *London* to present your Discourse your self, they have found an Expedient, *viz.* to desire you, and such others as shall be in that Case, to send it up to *London* to any of your Friends, that may present and read it for you. It is farther intended, that such Discourses shall be made publick, if the Author so think fit, not otherwise. Pray, Sir, let me know that you have received this, together with your particular Answer to the latter Part thereof.

Dr. Lister to Mr. Ray.

Dear S I R,

I Am well pleased you like the *Table of Snails*: Some things I have thought fit to alter since they were sent up; particularly the Title of the third Snail, which I now call (after a great Collection of them) by this Title, which I think will comprise all the Difference, *Cochlea citrina aut leucophæa unicolor, vel unica, vel 2, vel 3, vel 4, plerumq; verò quinis fasciis pullis distincta*. Again, some of the Figures are unhappily mistaken by the Graver, which I hope to get corrected; particularly the 19, which I guess to be that you mean by your *Nerites Fluviatilis*. This I say, if any, is that you mean; but I hope yours is a new Species. I have my self figured it by the Life, and indeed it was as truly designed before in the Design; but I know not how monstrously mistaken by the Graver in the Plate. 'Tis true, the second is that you and I found about *Montpelier*; but I have found it in divers Places in
England

England since my Return, in Kent, in Lincolnshire, here at Oglethorpe, in a Woody-Bank, upon the Wharf plentifully near the Paper-Mills. The *Patella Fluviatilis* you mention is a curious Discovery, and is wholly new to me: I shall look for it here, if perchance it may be found in these Parts.

York, Octob. 1674.

Dr. Lister to Mr. Ray.

Dear Friend,

York, Decemb. 13. 1674.

I Had a Letter from the *Barbadoes* from a learned and ingenious Physician of that Island the other Week: He practis'd long in *Cleveland*; and in his Passage this Summer to the *Barbadoes*, gives me an Account of two Birds he met with at Sea. I thought to ask your Opinion of them. I shall transcribe that Part of Dr. Town's Letter to me that mentions those Birds.

“ One Night, when the Mariners were disagree-
 “ ing about our Distance from *Barbadoes*, a Bird,
 “ by the Seamen usually called a *Booby*, lighted upon
 “ a Man sleeping on the Quarter-Deck, which,
 “ from its Stupidness, has its Name, for it sat very
 “ quietly, looking about it, until it was taken by a
 “ Seaman's Hands; and by the Cry of this (which
 “ is like, and almost as loud as the Sound a *Buck*
 “ makes upon the *Rut*) immediately came another
 “ *Booby*, which was taken after the same Manner:
 “ And many more might have been so taken (the
 “ Seamen said) had there been more about the Ship;
 “ but they were welcome Guests, because they put
 “ us out of doubt, as usually appearing about 40 or
 “ 50 Leagues from Land: They are of no Beauty at
 “ all, yet I'll send them to you, because they are
 “ great

“ great Enemies to the *Flying Fish*. As soon as we
 “ crossed the *Tropic*, we were met by a Bird called
 “ the *Tropic-Bird*, because they commonly are first
 “ seen at 22 or 23 Degrees of Latitude. They are
 “ about the Bigness of a *Parrot*; the Feathers ap-
 “ peared white, with red intermix'd; the *Beak* crook-
 “ ed, and of a Scarlet Colour; their *Tail*, at a Di-
 “ stance not to be seen, but, nigh at hand, about
 “ the Thickness and Length of an ordinary Tobac-
 “ co-Pipe. I wonder what their Food may be so
 “ far from Land; for I cannot learn that they have
 “ been observed to prey upon any Fish, or Birds,
 “ unless they resort to some small Island yet undis-
 “ covered. I heard, since I came hither, that they
 “ frequent the Rocks on the Windward (or East-
 “ Part) of this Island; which, if true, I'll endea-
 “ your to procure some, &c.

Mr. Ray to Dr. Lister.

Dear S I R,

Middleton, Dec 19. —74.

I Thank you for the Information sent about the
 Birds. I have read of the one in some Books of
 Voyages, viz. the *Booby*, but know nothing else of
 it but the Name. I wish I had a particular Descrip-
 tion of it, that so I might insert it in our *Ornithology*.
 The Doctor, your Friend, seems to promise you the
 Bird dried; which, when you receive, I shall beg a
 Description of it from you.

The *Tropic Bird* dried I have seen in the *Repository*
 of the *Royal Society*, and have described as well as
 I can. I find it to belong to that Sort of Birds which
 I call *Palmiped*, with all the four Toes webbed to-
 gether, such as are the *Cormorant* and *Soland-Goose*;
 and therefore, without doubt, preys upon Fishes, and
 S lives

lives only upon them. That which I observed most remarkable in it was, that the Tail consisted only of two very long Feathers: At least, I was informed that it had only two Feathers in the Tail, and there were but two left remaining in the Case, which accords well with what Dr. Towne writes: Yet I am suspicious, that besides those two long Feathers, there are other shorter in the Tail.

Having finished the *History of Birds*, I am now beginning that of *Fishes*, wherein I shall crave your Assistance, especially as to the *flat cartilaginous* Kind, and the several Sorts of *Aselli*: Especially I desire Information about the *Cole-fish* of Turner, which I suppose may sometimes come to York. When I was in *Northumberland* I saw of them salted and dried, but could not procure any of them new taken. Besides the common *Cod-fish*, the *Haddock*, *Whiting* and *Ling*, I have in *Cornwall* seen and described three other Sorts of *Aselli*, from which I would gladly know whether the *Cole-fish* be specifically distinct. I am also at a Loss about the *Codling* of Turner, what manner of Fish it should be, and how certainly differenced from the *Cod-fish*. Of the *flat Cartilaginous* I have seen and described 4 or 5 Sorts; but I am to seek what our Fishermen mean by the *Skate*, and what by *Flair*, and what by *Maid*. By the Affinity of Name one would think that the *Skate* should be *Squatina*, which yet I believe it is not. The Sorts of *Raia* that I have seen and described, are the *Thornback*, or *Raia clavata*, a certain and characteristick Note of which is want of Teeth. 2. The *Raia lævis vulg.* 3. *Raia lævis oculata*, with only two black Spots on the Back, one on each Side. 4. The *Raia Oxyrhynchus*: 5. The *Rhinobatos*, or *Squatino-raia*. *Rondeletius*, and the following Authors out of him, have many more Sorts. But I have not Time to add more, than that I am, &c.

Mr. Oldenburgh to Mr. Ray.

S I R,

London, Decemb. 21. —74.

YOUR accurate Discourse touching the *Seeds*, and the *Specifick Difference of Plants*, was read before the Royal Society on *Thursday* last, and was so well received, that the President, in the Name of the whole Body, returns you their hearty Thanks for so good an Entertainment. They doubt not, but that you will in good time communicate to them also what you shall farther observe concerning the *Seeds of Bulbous Plants*, and the *positive Specifick Difference of Plants*; and they wish you much Health, and good Success, for performing what you intend in reference to the History of Animals: Wherein, if I could contribute any thing, I would do it with great Joy. I received lately from *Hamborough* a *German Description* of that Countrey in *Africa*, call'd *Fetu*; (of which I have given some Account in the last *Transactions of November*) and found in the Book bound some loose Cuts, which I see not that they belong to that Book; amongst them were these three here enclos'd, which I thought fit to send you, that you might see whether you have all the Birds therein express'd, and whether you know the Plants that are in one of them. That Cutt, which is mark'd 1, seems to represent the *Anas Arctica Clusii*, the Eye only is different, if I mistake not. You may, when you have done with them, return them to me in a Paper to Mr. *Martin*; to whom I spoke lately, that I had gotten Permission to have a Draught taken of the *East-Indian Pigeons*, and the other Birds, brought from those Parts by Capt. *Erin*, (now living on *Tower-Hill*) if it were worth while. But he tells me, that

since we cannot have their Names and Peculiarities, it will be improper to insert them into your *Ornithology*. All that I could learn of the *Pigeons* was, that they were *Suratta-Pigeons*, sprightly, and with extraordinary broad Tails, which they spread out almost Peacock like. And as to the other Birds, no more can be said of them, than what fine Shape and variegated Colours they have. Having thought fit to give this Notice of these Creatures, I must leave it to you what Use to make of it, who am, &c.

P. S. In the above-mention'd *African* Book there is Mention made of a Quadruped, call'd *Adwa*, which I remember not to have met with in other Authors. 'Tis describ'd to be no bigger than a Lady's Lap-Dog, in Shape like a young Roe-buck, with a beautiful long Head, very neat Feet, short slender Body.

Just when I was going to send this, I was inform'd that you had caused only some young ones of the little *East-India* Birds to be drawn, but that the old ones differ so much from the young ones, by their being most curiously speckled, (which I hear the young ones are not) that those that know the old ones, and not the young, will hardly think them to be the same Birds.

Dr. Towne's Letter about the Shark to Mr. Dent, and by him communicated to Mr. Ray.

I Send you by this Fleet the Skin of a young *Shark-Fish* stuff'd; you may receive it from Mr. Penn, if it come safe to him. The *Skin* of this Fish (when fresh) is so porous, especially about the Head, that

that tho' never so little squeez'd, it sends forth Water-Drops about the Bigness of a small Pea through its Pores, and so harsh, that it wore my Nails, as I was helping to flea it, to the quick almost in a Moment. I believe you may now whet your Knife upon it. His *Ventricle* is without any Folds in its inmost Coat, or any sensible Acidity, which makes me think, that perhaps the Philosophers do not justly attribute *Concoction* to the famous *Succus Acidus* and *Calor Innatus*, for both of these he wants, and yet is extremely voracious, insomuch one was taken (by some of our Seamen in a former Voyage) that had in his Belly a Woman stitch'd up in a strong Rug, and bit into Halves, and almost digested to the Bones within the Compass of a very few Hours; for the Woman died, and was thrown over-board the same Day the Shark was taken. He has usually the Attendance of about 2 or 3 *Pilot-Fishes* about a Foot long, which are commonly seen to taste of the Bait immediately before their Master: And there are often found sticking to his Side small Fishes, which, with transverse Folds upon the Head and Back, cling close to his Skin, and I believe wait there for some little Reversions that slip from his Teeth. When he *catcheth at a Prey*, he turns his Belly up, thrusteth his Jaw-bones forth of the Skin, (as you see it now) and sets his Teeth upright, which, at other times, lie flat, in 3, 4, 5, or 6 Rows, according as his Age is. I could make no more Observations, the Seamen urging me to rid him out of hand, thinking it a very childish Thing to sit poring on a Carcass. I see daily here strange Plants, which, with their Seeds and other Toys, I would have long ago sent you, could I have got a Friend that would take care of them; but as soon as may be you shall have them.

This is part of the Letter I receiv'd from Dr. Towne, and mentioned to you. I have the Fish hanging in my Hall.

Dr.

*Dr. Lister to Mr. Ray at Coleshill in
Warwickshire.*

Dear S I R,

I Received the kind Token of the *Ornithology* with much Joy: I pray for the Continuance of your Health, that you may with the same Diligence and Accurateness put forth the remaining Papers. Certainly never Man was so happy in a Friend as he has been in you, who have been so just to his Memory and Labours.

I am very glad you say so much concerning the *English* Edition, which you tell me you intend to augment.

If I might advise you in the History of *Hawks*, it would be very acceptable to have their Managery and Training, which I find is done with much Skill and Faithfulness in a certain late Piece, call'd the *Gentleman's Recreation*, printed 74. where is the best Account of *Hawks* and *Hawking* that ever I met with.

Again, in the History of *Small Birds*, some Account of the keeping and ordering of them in Cages would please, which also is very well done in a late Book, entituled the *Epitome of the Art of Husbandry*, where you will find a large and very accurate Tract of Singing-Birds: Both done by experienc'd and judicious Persons in that Way.

I shall hint to you the Perusal of the late History of the *Island of Fero*, where is much said of the *Puffin* and that Tribe.

Again, you will find a most accurate and very particular Anatomy of an *Eagle*, done by a good Hand, viz. *Borrichius* in his Vindication of Chymistry against *Conringius*,

Conringius, a late Piece: I would you saw it, for I think it worth the inserting into your History.

If I meet with any thing farther, I will give you notice of it.

The *Curruca*, or *Hedge-Sparrow*, which I have often seen, lays Sea-green, or pale-blue Eggs, which neatly emptied and wired, fair Ladies wear at their Ears for Pendants.

One and the same *Swallow* I have known, by the subtracting daily of her Eggs, to have layed 19 successively, and then to have given over.

The *Bunting* breaks not Oats, but shells, or hulls them most dextrously, as I observe, having of them by me at this present in Cages.

The *Robbin-red-breast*, will not touch a *hairy Caterpillar*, but will gladly take and eat any sort of smooth one that I have given to him; and there is no better Way speedily to *tame*, and make *wild Birds* sing, than to give them a pleasing Insect or two daily; neither thin nor thick-bill'd Birds but will gladly eat Spiders, as I have experienc'd in some Kinds.

York, Feb. 8. —75.

*Sir Philip Skippon from Wrentham
to Mr. Ray.*

S I R, *Wrentham, Feb. 11. 1676.*

I Shall now acquaint you, that having read the Observations sent from *Barbadoes*, and publish'd N^o. 117. of the Philosophical Transactions, I soon after discoursed about them with one Mr. *Tho. Glover*, an ingenious Chirurgeon of these Parts, who lately came from our Western Plantations, having lived some time

136 *Sir Philip Skippon to Mr. Ray.*

time in *Virginia*, and nine Months in *Barbadoes*, where he says he has let above 20 Negroes blood, and always observ'd the Colour to be as florid and red as any *European's* Blood; and that he never saw any of a dark Colour, as is represented by the Letter the ingenious Mr. *Lister* received from that Island. The Difference in these two Persons Observations ought therefore to be farther examined by Correspondents in that and other Places, (where *Blacks* inhabit.)

Purflain, Mr. *Glover* says, is also very common in *Virginia*, and troublesome too to the Tobacco Planters. *Asarum* is much used by the *Indians* to provoke Vomiting, and they are frequently troubled with violent Colicks, which oftentimes terminate in Palsies. ****

Mr. Ray to Dr. Lister.

Dear Friend,

I Receiv'd yours of *February* 8, and have resolved to follow your Advice, in adding to the *Ornithology* an Account of the Ordering of *Birds* for singing, as also something of *Falconry*; and besides an Epitome of the *Art of Fowling*. To this Purpose I sent for the Books you minded me of about those Subjects. I find that the *Author of the Gentleman's Recreation*, in what I have read in him, is a mere Plagiary; all that he hath concerning *Fowling* being transcribed out of *Markham's Art of Fowling*, without once mentioning his Author, as you may soon find by comparing them. I suspect the like of his *Falconry*. What he writes of the *Haggard Falcon* is contracted out of *Latham*. When I shall have compared the rest with *Latham* and *Turbervil*, I shall be able to tell you whether it be not borrowed of them.

As

As for the Tractate concerning *Singing-Birds* in the Epitome of the Art of Husbandry, I do not find what is there delivered so manifestly purloin'd from any one Author, altho' in *Aldrovand* and *Olina* I find the Substance of most he hath; only that about the Manner of Breeding *Canary-Birds* is either his own, or borrowed of some Author unknown to me. Much also he hath about the *Woodlark*, which is either of his own Observation, or as the other taken out of some modern Writer, it hath not been my Hap to see. This Author I believe hath good Skill in the feeding and ordering of Singing-Birds: Yet he makes a fifth Sort of *Throftle*, which he calls a *Heath-Throftle*, which I never saw, nor heard of, nor any Author besides that I know of mentions. I pray read the History of it in him, *Page 92.* and tell me whether any such Bird be known to you. These Birds, he saith, in some Countries are called *Mevissès*. I am sure his fourth [Wood-Song-Throftle] is so called in *Essex*, and I believe elsewhere. What he writes concerning a Hole left in the bottom of the Nest, I remember not to have observed in such Nests of this Bird as I have found.

I was somewhat offended at his Manner of writing concerning the *Solitary Sparrow*, as if it were a Bird breeding with us in *England*, advising which Bird to chuse out of the Nest to bring up, &c. All which History makes me suspect he transcribed what he hath out of some Writer, either *Dutch*, *French*, or *Italian*, that I have never seen, both concerning this and other Singing-Birds: For the *Solitary Sparrow* is a Bird that was never seen, scarce heard of, in *England*, and but rare in *Italy*. If he were so well acquainted with them, I wish he had informed us where they breed. But enough of Censure. In the History of the *Fero Islands* I find no more Species of Birds than what I have already inserted in the *Ornithology*, partly of our own Observation, and partly out of *Clusius*,
T who

who had an Account and better Descriptions of them from *Sloier* than any be in this History; only here is more of the Manner of climbing the Rocks for taking them. *Borrichi's Anatome* of an *Eagle* I have not seen: But there is also a very particular *Anatome* of it in *Aldrovand*, which I thought not fit to insert, few Readers being willing to take the Pains to read, much less consider such Descriptions, unless illustrated by Figures. Mr. *Willughby* himself hath left a *Myotome* of a *Swan*, and some other Birds, which I thought not fit to cumber the Book with.

Sutton Cofield, April 4. ---76.

Mr. Ray to Dr. Lister.

Dear S I R,

I Have been lately solicited to reprint my *Catalogue* of *English Plants*, partly by the Bookseller, and partly by an unknown Person, who sent me a Letter without a Name subscribed; and withal pressed me much to add to each Plant the *French* Name: Whereupon I thought to have intreated you to undertake that Trouble, as you are a Master of the *French* Tongue, my self being but a Smatterer in that Language, and wanting the Conveniency of Books to assist me in such an Undertaking. But, upon serious Consideration, concluding that those Names would not render the Book really much more useful; only, if well done, might add a little to the Author's Reputation, (to the Vanity of any Affectation whereof I desire to be wholly mortify'd) I resolv'd not to add them, and have sent the Copy up to *London* as it is. If you have observed any Errors or Mistakes therein, or have any new Plants or Observations to add, be pleased to send them; and though the Book be already

ready

ready gone out of my Hands, I shall take care to get them inserted in their proper Places. Since my last, I compared what the *Gentleman's Recreation* hath concerning *Hawking* with *Turbervile's Collections*, and find every Syllable transcribed thence. The like I dare say he hath done about *Hunting*; for there is of *Turbervile's* a large Treatise of *Hunting*: And for *Fishing* doubtless he hath done the like. I had not blamed him, had he acknowledged his Authors, and confess'd to the World, that all he hath is nothing else but an Epitome of such and such Books; but now he hath basely abused the World. Mr. Oldenburgh hath published him as a considerable Author, and in his Preface made us believe that he hath advanced Knowledge, by giving us a perfect Catalogue of Fishes. I am sorry Mr. Oldenburgh should be so mistaken as to attribute to such a pitiful Plagiary any Improvement of the History of Nature. But enough of him, and for this Paper. I recommend you to the Divine Protection and Blessing, and rest, &c.

Sutton Cofield, June 14. --76.

Dr. Lister's Answer to Mr. Ray.

Dear Friend,

I Am well pleased your *Catalogue of Plants* is again to be printed; it certainly deserves it. You might have commanded any Service in my Power; but I think the Addition of the *French* Names would have been but a Fancy.

I cannot say I have any thing worth sending you to add. I shall only put you in mind that you leave not out the *Vinegar* that is to be drawn from *Gallium Luteum*, which I have tried, and is a rare Experiment, and is owing, for ought I know, to *Borrichius*.

You will see a farther Account of it in the *Danish Transactions*.

Also you may please to remember the *Fungus Piperatus*, which I have yearly found in *Marton Woods* ever since.

Again, the *Fulminating Powder*, which the Spikes of *Muscus Lycopod.* yield, I have gathered much of it in *Craven*, and find it will fire briskly in a Flame. I gather'd the Ears a little before they were ripe, and put them in a Box, and found they shed their Powder of themselves.

See more in the *Germ. Transactions*, and in *Olearius*, of this.

As to that Question of a *Heath-Throble*. I find that the *Ring-Ouzle* is so called with us in *Craven*, where there is every where in the Moores Plenty of them. I am glad you have discovered those Authors to be Plagiaries. This Sort of Men being the Bane and Pest of Learning, and you ought to brand them.

I have much improv'd my *Catalogue of Snails*, having added five Species thereto. I long to see you, that I might confer with you about the Note I gave of this Nature; for I would either put them out separately, if they deserve it, or throw them into Mr. *Willughby's* Store, if perchance any thing has escaped his Diligence. But I shall resolve upon nothing till I see you. Methinks we might meet half Way the latter End of the Summer.

York, July 2. --76.

Mr.

Mr. Ray's Answer to Dr. Lister.

Dear S I R,

Yours of July 2^d came to hand. I thank you for the Advices therein contained. I should my self have remember'd and inserted the *Fungus Piperatus*, of which you formerly sent me a large Account. But the Experiments of the *Vinegar* of *Gallium*, and *Fulminating Powder* of *Lycopodium*, if ever I read any thing of them, were quite slipt out of my Memory. I fancy that I have read something of the first in our Transactions; and the second, if it be in *Olearius's* Travels, I must also have read of; but, it seems, heeded not. I have not at present by me those Transactions; or other Books, to which you refer, and therefore beg of you a full Account of both those Experiments; for I should be loath either of them should be omitted in my Catalogue; which I suppose is e're now begun to be printed, tho' I have not yet received any Proof of it. I thought it the more expedite Way to give you this Trouble, than to stay the sending to *London* for those Books. Your Notes and Observations in Natural History do very well deserve to be made publick; and I should advise rather by themselves, than be buried in Mr. *Willughby's* Work: The Printing also of which depends upon my Life and Health; and, besides, it will be long before his *History of Insects* and *Exanguia* be fitted for the Press, I being at present upon the *History of Fishes*, which will take up still a Year or two's Time. I have only this to object to you, and my self, against their speedy Publication, that the longer they lie by you, if still you prosecute the same Studies and Enquiries, the more perfect and full they will be, every day almost adding
or

or correcting, or illustrating somewhat; but if you have quite given over those Researches, defer not to put them out. If it had been my Hap to find out so many before unobserved Particulars and Experiments, I should have thought my self wanting to my own Reputation, had I not published them in my own Name; though I confess I have always thought, that for new Inventions and Discoveries we are rather beholden to a good Genius, ἀγαθὸν δαίμονι, than to our own Wit or Industry; at least the Faculty and δεινότης, or Shrewdness in inventing and discovering, is a particular Gift of God, and not conferred upon all. But yet those Discoveries and new Inventions are not granted even to such Men usually, unless busied in searching and enquiring into those Things. ****

Sutton Cofield July 15. ---76.

Mr. Johnson to Mr. Ray.

Dear S I R,

Brignall, April 16. ---77.

WHAT I said of *Salmons* being perfect at their first Return from Sea, I did not mean that they were come to their utmost Growth or Bigness, for I think they wax for 5 or 6 Years; but that they were *true Salmons*, (*i. e.*) neither *Trout*, *Scurfe*, nor *Grey*, but bigger than any of these, and bring forth young that Year. In the River *Tees* we take notice but of two Distinctions of Size, *viz.* a *Salmon Cock*, which some call a *Half Fish*, usually about 20 or 22 Inches; and a *Whole Fish*, above that Length. In the Mouth of *Eden* in *Cumberland* the Fishers have four Distinctions of yearly Growth (after the first Summer, when they call them *Free*, or *Frie*, as we *Smowts*, or *Smelts*) before they come to be *Lackes*; and this they say they have curiously observed, by fixing so many Pins in the Fins of Yearlings, or two Years

Years old, and after taking them again. And thus perhaps in *Ribble* they have made the like Observations, tho' I am a little jealous that their *Sprods* are but *Scurves*; their *Morls Greys*, their *Fork-Tails*, our *Cocks*, their *Half Fish*, *Middling Salmon*, and their *Salmons*, the *Lacks*, or over-grown *Salmon*. I have one Observation more, viz. Besides what *Salmons* are bred in our Rivers, there come some Years from the North (I guess when the Winds are much Northerly) great Shoals of *Salmon*, which often take in at the Mouths of our Rivers, especially if the North Bar be open: And these have a broad blue Spot on their Heads, and are by our Fishers therefore call'd *Bluecaps*; the Sight of one of these makes a Fisher leap for Joy, especially if his Gills be lowfy, for then he is certain there is a great Shoal, and one starves another for want of Food. The Manner of the *Breeding of Eels* I do not certainly know, but I think them to be oviparous; for I have several times found in one small Bed of Mud great Numbers of very small *Eels*, more I am sure than the Belly of any *Eel* could contain, lying very close together like the young Fry of other Fishes. What your *Cornish Butterfish* is I know not; I a little suspect it will prove the same with our *Sea-Snail*, if yours melt into Oil, as ours do. I sent you a Draught of ours long since with red Chalk.

I wonder as much that Fishers have not certainly determined whether *Salmons* live upon any thing, save Water, and what? As that Horsemen have not agreed what that is, the Fole is said to *sneez*, which they call a *Milt*. I am apt to believe that Water cannot be a competent Sustainance for them: Common Experience tells us that they will not only take a Worm, or Minnow, or other small Fish, but swallow the Bait with the Hook down into the Stomach. 'Tis likely they take no Food till what they had be digested, and possibly their Stomach may digest very quickly.

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quickly. Farther, I think only the Anglers have made the Observation of finding their Stomachs always empty ; but I am persuaded, that if the Net-fishers would open any considerable Number, they would find in them Food indigested, which they seldom do, but sell them whole. Perhaps I may give farther Answer to this *Quære*, and some others about *Whitsontide* ; at which Time I purpose to go to our Coasts, and gather what I can. In the mean time wishing you Success in your Studies, I rest, &c.

In a Letter from Mr. John Aubrey to Mr. Ray.

London, May 7. 1678.

I Have at length gotten my Desire, *viz.* an able Frenchman, to translate the *real Character* [of Bishop Wilkins] into French. It is Dr. Lewis du Moulin, Son of the eminent Doctor.

Mr. Aubrey to Mr. Ray.

Honoured S I R,

London, July 9. 1678.

I Heard lately from my Friend Mr. Paschal, [as I often do] who tells me he hath given an Account to some Friends of his of some *Tables* that might be made according to those of yours in the *Bishop's Essay*, and fitted to be hung up in Garden-Houses in the Manner of Maps. He desires me to advise with you if it might not be worth while to get those five (*viz.* 1 Herb-Leaf. 2. — 3. Herb-Seed-

Seed-Vessel. 4. Shrub. 5. Tree) done at *London*, and made publick; and that if to the Name of each Plant were adjoined a neat Cutt, and to the Description in the Foot of the Table, in *English*, were added the several Names in *English*, *Latin*, *Greek*, they might become a fine Ornament for Summer-Houses, and very useful for those who delight in that kind of Knowledge. If this be approv'd, the like may be done for those other Tables of *Stones* and *Metals*, and those also of *Insects*, *Birds*, and *Beasts*. The same may be also put into a little Pocket-Book, which may be of Use where the larger Tables cannot be had. He adds, [and Sir *Christopher Wren* agrees with him in it] this may do good Service, to occasion the *Real Character* to be taken notice of, and the Way and Manner of it to be understood. He says, if this find Approbation, he will take the Pains to draw these out, with the Description of each Species, as it is in the *Bishop of Chester's*, and send it up, desiring that the learned Contriver of those Tables, Mr. Ray, may be consulted with for making such Alterations and Additions as he shall see Cause for.

Mr. Merret [the Doctor's eldest Son] hath methodized the Laws of *England* very ingeniously, *secundum mentem Episcopi Cestriens*. which was never done before.

Mr. Ray's Queries to Dr. Tankred Robinson.

QUERIES.

1. **W**Hether the Bird called *Macreuse* at *Paris* be the *Anas Arctica* of *Clusius*, or the *Manks Puffin*, or a Species distinct from both, perhaps a sort of *Colymbus*?

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2. Whether

2. Whether the Vapour ascending out of the Earth, and causing an Appearance of boiling in a Water called the *Boiling Fountain* at *Peroul* near *Montpellier*, be inflammable by the Application of a lighted Candle, &c. as that is which causes the like Phenomenon at *Wigan* in *Lancashire*?

3. Of what sort of *Moss* they make their *Cypress-Powder*, and whether of more sorts than one at *Montpellier*, either bring a Sample of it, or describe it so exactly, that one may not mistake it.

4. Whether the *Chondrilla Cærulea Cyani Capitulis* of *Baubinus*, called commonly *Sesamoides*, have naturally a full or double Flower, or only consisting of a Pale or Border of Leaves, encircling a Thrum of small Flowers, which are vulgarly mistaken for *Stamina*?

The like Query I would make about the *Cichorium Pratenſe Vesicarium* of *Columna*, which grows in the Fields about *Leghorn*, as the former does plentifully about *Montpellier*.

5. Whether the *Stæchas Citrina altera tenuifolia sive Italica* J. B. be specifically distinct from the *Stæc. Citrina tenuifolia Narbonensis* J. B.? It grows plentifully in the Mountains of *Liguria*, as about *Gavi*, *Voltagio*, &c. To be sure of this, the best Way would be to compare the Plants together.

6. I observed in the Borders of some Fields about *Leghorn* a sort of *Trefoil*, with a little Spike of bright purple or red Flowers, which afterwards turned to spumose Vesicles, like to the Head of the Strawberry Trefoil. Whether this be the *Trifolium Folliculateum sive Vesicarium minus purpureum* J. B.?

7. Whether the *Seseli Pratenſe Monſpelienſium* be a Species distinct from our *English Meadow Saxifrage*? To me it seemed the same.

8. There is a sort of *Jacea purpurea capitulo spinoso* growing on the Sands a little beyond *Naples*; of which I desire either the Seed, or a Plant dried, or

so exact and particular a Description, as that I may know whether it be already described or not. I saw at the House of *John Maria Ferro*, an Apothecary in *Venice*, living near *Santa Maria Formosa*, many rare dried Plants, but especially a great Number of Figures of Plants drawn exactly by a curious Hand in black. If the said Seignior *Ferro* be yet living, please to visit him, and enquire of him whether he designs to engrave and publish any of those Icons, or be willing to part with them for their Worth to one that will.

*Dr. Tankred Robinson's Answer to
Mr. Ray's Queries.*

S I R,

Paris, July 12. 1683. N. S.

IN order to satisfy those *Queries* which your Curiosity and Goodness were pleas'd to bestow upon us, we have been very industrious since our coming to *Paris*, but could not meet with the *Macreuse*, it being now out of Season; and the Histories which the *French* here do give of it are so very various, that a Man knows not what to conclude from them: They all say, that 'tis originally a *Fish*, (as some erroneously imagine our *Barnacles* to be) and therefore the Convents, and most of the Inhabitants here, do generally eat it in *Lent*, and upon Maigre Days. My Friend Mr. *Charlton*, a very curious and worthy Gentleman, hath promis'd me, that as soon as ever the *Macreuse* comes into Season here, he will get it exactly design'd and painted to the Life, and the Skin stuff'd; so that then, Sir, you shall have a better Account of it. In the mean time be pleas'd to accept of the following Description, which I have taken

ken out of a late *French* Author, not to be met withal now in Booksellers Shops, the Priests having forbid it. I am confident 'tis faithful, and will afford you some Light. *La Macroule ou Macreuse passe constamment à Paris, en Normandie & ailleurs pour la veritable Oye d' écossé.*

Monsieur Tournesort, a *Languedoc* Man, and Doctor of *Montpellier*, demonstrates now the Plants in the King's Garden here. He speaks with great Veneration of you; but in his Demonstration of the *Bistorta Alpina* he dissented from you, saying, that you confounded the two Species together; whereas he affirm'd they were really distinct. Since our coming to *Paris* we have observ'd a few Plants growing wild, that may be not at all found in *England*, or rarely, as the *Reseda Crispa Gallica*, describ'd by *Boccone*, the *Conyza Canadensis annua alba acris linariæ foliis*; *Psyllium erectum*, *Bauhin. pin.* *Veronica erecta angustifol.* *B. pin.* *Pulmonaria maculosa*, *B. pin.* *Turritis minor*, *B. pin.* *Asclepias flore alb.* *B. pin.* *Sideritis hirsuta erecta*, *B. pin.* *Chamædryas repens maj. vulgar.* *B. pin.* *Chamacistus plantag. fol.* *B. pin.* *Securidaca dumetorum flore vario siliquis cornic.* *B. pin.* *Fœnum Burgundiacum.* *Attractilys lutea*, *B. pin.* Pardon, Sir, the imperfect Names, for we have few or no Books by us, unless your Travels, and 2 or 3 more. No more Trouble at present from.

Mr. Ray, to Dr. Robinson,

SIR,

I Render you many Thanks for the Pains you have taken in endeavouring to resolve and satisfy me as to the Query concerning the *Macreuse*. The Description

ption of Monsieur Graindorge is scarce sufficient to determine to what Genus it belongs, much less whether it be a *non-descript* Species. Those Notes of having flat Feet, and those weak and unfit for marching on Land, a small flat Back Claw, or Toe, small Wings in Proportion to the Bulk of its Body, being all over black, argue it to belong to the Genus of *Colymbi*, or *Douckers*. But what he adds of the Flatness of its Bill, and its rising up with a high Eminency, and its various Colours, agree not to the *Douckers*, but rather to the *Palmipedes Tridactylæ*: So that I am still at a Loss about it; but yet do now conjecture it to be of the *Douckers* Tribe, because it comes in the Winter-Time, and breeds not here: Whereas the *Palmipedes Tridactylæ* come to us in Summer, and breed with us, none appearing in our Seas all Winter. But if it be a *Colymbus* (as is now to me most likely) it is of a middle Size, and of the caudate Kind; for they only have musculous Stomachs, or Gizzards, and are by Extremity of Weather driven into our Seas, and the Mouths of great Rivers in Winter-time. What he hath of the Mobility of the upper Chap of its Bill, I believe to be a Mistake. From this Description I can conclude negatively, that it is not what I imagined it once to be, *viz.* the *Puffin* of the *Sillyes* and *Isle of Man*; an exact Picture, or the Skin stuff'd, when obtained, will at first sight inform us to what Tribe it appertains, and whether it be already described or no.

Monsieur *Tournefort* is a Person I have no Knowledge of. When I was at *Paris*, Monsieur *Joncquet* demonstrated the Plants in the King's Garden. Monsieur *Marchand* and Dr. *Magnole* of *Montpellier*, were the most skilful Herbarists I met with in *France*: But it is now about 17 Years since I was there, and there may be some arisen of Note and Eminency since that Time.

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As to the *Bistorta Alpina*, I am now come over to Mr. *Tournefort's* Opinion, that there are two Sorts thereof.

Of the Plants you have observed about *Paris*, the *Conyza Canadensis annua alba*, is improperly styled *Canadensis*, as Dr. *Morison* also takes notice, being frequently found in the Woods and Vineyards of *France*, and, if you will believe him, of *England* also, where it hath not yet been my good Hap to meet with it. He entitles it *Conyza acris annua alba*, omitting the Epithet of *Canadensis*.

Black Notley, July 27. —83.

Dr. Robinson to Mr. Ray from Montpellier.

S I R,

Montpellier, Sept. 10. 1683. S. N.

I Troubled you with a Letter from *Paris* last *July*, giving an Account of the *Macreuse*. 'Twas not so satisfactory as I wish'd, the Bird being then out of Season: However, my worthy Friend, Mr. *Charlton*, (now at *Paris*) will take care to get the *Macreuse* exactly design'd to the Life, together with the Skin stuff'd, which he intends to preserve in his own excellent *Musæum*, but will order them to be left at Mr. *Faithorn's* for your Use. As for the Queries which you have been pleas'd to give me about *Montpellier*, I am afraid that I may be defective in answering them, the present Troubles of *Languedoc* putting a great Stop to Arts and Sciences, there happening daily Skirmishes between the King's Soldiers and the Protestants of these Parts; yet I have been a little industrious in the Search of Natural Curiosities, tho' not so accurate as I ought to have been; especially
when

when I intend to write to the best Botanist, and the most accomplish'd Naturalist of this, or perhaps any Age.

1. The Vapour ascending out of the Earth, and causing an Appearance of boiling in the Fountain of *Peroul*, is not in the least inflammable by the Application of a Torch, or Candle, which I experimented several times; therefore 'tis of a different Kind from that of *Wigan* in *Lancashire*. This Vapour rushes out of the Ground so violently in some Places, that I had much ado to keep a Candle lighted near it: 'Tis a perfect Subterraneous Wind, making the Water (which we carried along with us) much colder than before it was put into the Holes, which we made in the adjacent Earth. A learned Phyfician of *Montpellier*, then in company with me, oppos'd your Opinion concerning the bubbling of this Fountain, ascribing it to a strange Fermentation between the Earth and the Water; but I presently convinc'd him, by putting several Parcels of the Earth into Vessels, and pouring Water upon them, for then we could not perceive the least Disturbance in the Water, which in the Ditch itself was heav'd up 3 or 4 Inches perpendicular. I could not make any chymical Experiments upon the Water itself, because of its Scarcity; but the Inhabitants of *Peroul* told me, that they all commonly drink of it when the Hole is full, without any Alteration. I am confident the Vapour does not impregnate the Water with any new Quality, but flies through it, just as tho' one should blow into Water with a Pipe. What our most ingenious and learned Country-man Mr. *Lister*, of *York*, hath lately writ of Mineral Waters, may (as I fancy) give some Light as to the Generation of this Subterraneous Air at *Peroul*. Upon putting my Ear close to the Ground, I perceiv'd a great Noise in the Bowels of the Earth, like unto the Hissing of hot Iron in Water.

2. The Perfumers at *Montpellier* do make their famous *Cypress Powder* generally of the Moss of the green Oak, for they tell me 'tis the most spongy, and, after washing and drying, will imbibe their Perfumes better than any other Moss whatsoever.

3. The *Chondrilla cærulea Cyani capitulis* hath only a Pale, or Border of Leaves, encircling a Thrum of small Flowers: It hath no full, or double Flower. M. *Magnole* told me, that he hath frequently found about *Montpellier* the *Chondrilla Sesamoides, dicta cærulea, flore completo Eyst. circa fontem Piguet*. This hath a very full Flower, and seems to me to differ nothing from the *Chondrilla cærulea Cyani capitulis*, but in its Flower.

4. The *Seseli Pratense Monspeliens.* agrees with our *English Meadow Saxifrage* in every particular: I cannot find the least Note of Distinction.

Thus far your Queries as to *France*; to which I will tack an Observation or two to fill up.

I have observ'd the Inhabitants of *Languedoc* to get a Tar-like Substance out of the *Juniperus major baccâ rufescente*, much after the same Manner as Pitch is got from the *Pinus* by a kind of Distillation *per descensum*. This they do successfully use in curing several Diseases of their Cattel, especially Scabs, *impetigo*, and such-like Diseases. I know a Practitioner in *Montpellier*, who frequently uses this same *Resina Juniperi* in cutaneous Diseases; and I fancy it may prove a good Medicine in some scorbutick and calculous Cases, if methodically and judiciously manag'd.

Since my coming into *Languedoc*, I have observ'd an Insect boring the *Ilex Coccigera* with an Instrument, or Organ, coming from its Belly. I know not whether it might not be conveying its Eggs into the *Ilex*, together with a venemous Vehicle for the Birth of the *Kermes*. I wish I could meet the same Opportunity again of making farther Observations. *Malpighi's* History of vegetable Excrecences might

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Dr. Robinson to Mr. Ray. 153

be farther confirm'd thereby, as that also which that excellent Naturalist Mr. *Lister* essay'd in the Philosophical Transactions several Years before *Malpighi*.

Since my coming to *Montpellier* I have seen several *Scorpions* creeping on the Walls: I think they are the same which *Swammerdam* hath figured in his History of Insects. Several curious Persons of this City have assur'd me, that they have kill'd several Animals with these *Scorpions*: So peradventure some Circumstances make them differ from those of *Italy*, with which *S. Redi* might make his Experiments. Animals stung by these *Scorpions* fall generally into Tremblings and convulsive Motions; their Blood is always found coagulated, which may make a Philosopher suspect that the *Venom* of these *Scorpions*, of *Vipers*, and many other Animals, may chiefly consist in a subtle acid ferment: For besides the Phænomena, we find by Experience that volatile Alcalies (as the *volatile Salt of Vipers*, of *Salt Armoniac*, &c.) are the most effectual Remedies in these Cases, as they destroy those nimble Acids upon the Account of Texture, and free the Blood from Coagulations. Be pleas'd, Sir, to pardon these imperfect Miscellanies, for you may encourage thereby one that does really admire you above the rest of Mankind, and is, &c.

Dr. T. Robinson to Mr. Ray.

S I R, *Geneve, April 18. — 84. S. N.*

SOME of your Queries are so extremely curious, and so severely nice, that neither I, nor the best Botanists, or Naturalists (that I have met withal beyond Sea) can satisfy such critical Thoughts. I am over-joy'd that so vast a Memory, so exact a Judgment,

ment, and so universal a Knowledge, will be employ'd in compiling a general History of Plants, an Undertaking fit only for your extraordinary Talents. I am in great Hopes (because I wish it very impatiently) that you will bestow on the World a general History of Nature; (if God Almighty bless you with Health and a long Life) 'tis very defective at present, and seems to call for Method and Perfection from you.

M. *Marchand* is dead at *Paris*, so is *Zanoni* at *Bononia*, and *John Maria Ferro* at *Venice*. The three Volumes of dry'd Plants, and that other of Designs are now in the Hands of his Sons at *Venice*. I view'd them several times, and offer'd 20 Pistoles (which I thought to be their full Value) for them; but my Money and fair Words were despis'd, the jealous *Italians* keeping them like so many Wives. Signior *Zanoni* hath figured many of them in his *Histor. Botan.* which I have sent to *London*, where you may command it if you want it. M. *Magnole's* Catalogue lies also at Mr. *Faithorn's* at your Service.

I perceive the *Academy Royal* at *Paris* goes on with their Design of publishing a general *History of Plants*, of which M. *Dodart* printed some Years ago the Scheme and Model: For I saw 2 or 3 small Folio's of this History in several *Bibliotheces* at *Rome*, which I never met withal in the Shops at *Paris*, because I suppose it will not be sold till all the Volumes are perfected. I have several Things to object against this mighty *French* Work, design'd rather for the Glory of the Monarch than the Use of the Subject. If you had their Encouragement, I am sure your Work would be far more satisfactory and advantageous than theirs; which, in my poor Opinion, will be like a great Palace full of fine Ornaments, but wanting Order, necessary Conveniences, and regular Structure.

I had several Conferences with *S. Malpighi* at *Bononia*, who express'd a great Respect for you, and is
not

not a little proud of the Character you give him in your *Method. Plantar. nov.* which Book I had presented him withal a Day before. He honour'd me with two Visits at my Inn, where once he took Occasion to be a little angry with Dr. *Lister* (whose History he had by him) for his Opinion of the Origine of Stones, and Shells, resembling animal Bodies. He is very positive that he can demonstrate against the Doctor, having been very industrious upon that Subject when he pass'd the *Italian* Mountains, and when he was in *Sicily* and *Maltha*; besides, he shew'd me several Letters sent lately from Bishop *Steno*, (who after a Pilgrimage to *Loretto*, got that Preferment of the great Duke) now at *Florence*, concerning that Hypothesis: All which put him into some Passion against our sagacious Country-man, tho' he profess'd himself a great Admirer of Dr. *Lister*. I took Occasion from this to interpret some Passages and Discourses in your Travels relating to this Point, which pleas'd *Malpighi* to that Degree, that he smil'd to see you inclinable to his Opinion. Just as I left *Bononia* I had a lamentable Spectacle of *Malpighi's* House all in Flames, occasion'd by the Negligence of his old Wife: All his Pictures, Furniture, Books, and Manuscripts, were burnt. I saw him in the very Heat of the Calamity, and methoughts I never beheld so much Christian Patience and Philosophy in any Man before; for he comforted his Wife, and condol'd nothing but the Loss of his Papers, which are more lamented than the *Alexandrian Library*, or *Bartholine's Bibliotheca* at *Copenhagen*.

In my Journey from *Rome* to *Naples* I observ'd that Plant, commonly call'd, in the Physick Garden, *Ficus Indica*, growing very plentifully on the Hill Side near the *Tre Taberne*, as also near the Ruins of *Old Anxur*, and in several other Places near the *Via Appia*. So that it appear'd to me like a common wild Plant in that Countrey. Afterwards I rode through

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great Woods of Cork-Trees, more especially near *Fundi*, and *Old Formiæ*.

I remember very well I took Notice of the *Sardina* and *Sardone* at *Rome*, calling them always at Dinner *Pilchard* and *Herring*. All the *English* were of my Opinion, if I had had your Query then, I would have been more curious. I cannot think of any Difference, only (that which you intimate) Magnitude.

Dr. Robinson to Mr. Ray.

SIR,

Leyden, June 4. —84. S. N.

MOST of our Herbarists in these Parts are employ'd at present in carrying on the *Hortus Malabaricus*; the fifth Volume is ready to come forth, and eight more are design'd, a mighty Work of 13 Volumes. *Breynius* labours hard upon his second Century of Exoticks: And I am told that M. *Tournefort* intends to publish a History of some rare Plants observ'd by himself on the *Alps* and *Pyrenæan Hills*. The *Academy Royal* at *Paris* does also go on with their general *History of Plants*; but I long for nothing but yours, which I hope is now under the Press. I question not in the least but you have all the Encouragement that the learned Part of the World can possibly give you.

When I was in *Italy*, I observ'd many Operators there to make great Varieties of *Sapos* and *Balsams* out of the *Salts and Oils of Vegetables*: They proceeded much after the same Manner as you have set down in your *Observat.* p. 202, 203, (only adding now and then a few odoriferous Ingredients) viz. by uniting the Salt and Oil of the same Vegetable by the Help of slaked Lime. Without this latter Ingredient the Union would be difficult; for I have known

known several miscarry by omitting it. By this Process we have the entire Complexion of a Vegetable under the Form of a *Sapo*, or Balsam, (especially if instead of common Water for the *Lixivium* we make use of the distill'd Water of the Plant) a Composition, peradventure, as beneficial to Mankind as any other whatsoever. The little Experience that I have had in the World hath sufficiently convinc'd me (tho' I am unhappily a little inclin'd to Scepticism and Incredulity) of its successful and unexpected Efficacy in many Cases, internally given in proper Vehicles, and dos'd *pro re natâ, præmissis præmittendis*, as also externally apply'd, v. g. in *Icteric*, *Arthritical*, *Scorbutical*, and *Nephritical Cases*; in several *Nervous* and *Cephalick* Distempers, (more especially the *Palsy* and *Lethargy*) in correcting and destroying all Sorts of *Poysons*. I speak experimentally of the *Sapos*, or *Balsams* (made as before-mentioned) of the *Hypericum*, *Juniperus*, and *Abies*, tho' I do not doubt but the same may be expected from many other vegetable Compositions of the like Nature. I am so short upon this Particular, by reason of your extraordinary Sagacity, and great Talents.

The *Cortex exterior*, or outward Skin of *Sevil Oranges*, dry'd, powder'd, and given every three Hours in Electuar. or White-wine, is no mean Specifick in *Intermittent Fevers*, (even in *Quartanes* themselves) Dose zi. to zij. Next to the *Quinquina*, or *Jesuits-Bark*, I believe it may be one of the best alterative Medicines yet commonly known. I beg, Sir, a few of your Thoughts concerning the *Quinquina*, as to the Place of its Growth, and its History. Peradventure it may be an *East-Indian* Drug, and brought from the *Moluccoes* to *Peru*. I am much in the dark, and want some of your learned Communications about it. What *Bartholine* and *Signior Badi* have writ of it, does not satisfy.

When

When I was at *Rome*, I observ'd many times two Fathers, belonging to the publick *Elaboratories* there, to gather up and down in the Villa's and Gardens the *Gum* and *Resin* of the *Cypress*, as also to get an oily Substance from the Wood by a kind of Distillation *per Descensum*. Upon my Enquiry, the Fathers were so obliging as to tell me, that out of this *Resin* they prepar'd a *Lacca*, which being superficially spread, and dry'd over any body, would preserve it fresh to the End of the World. The Preparation is thus: After having distill'd a sufficient Quantity of Liquor from the *Resin*, they cohobate that distill'd Spirit on the remaining part of the *Gum*, (left in the Retort) which by a gentle Digestion dissolves, and becomes a *Lacca*. I told the Fathers, that the very same Preparation out of *Amber*, *Turpentine*, or *Mastich*, might serve as well for that Purpose. However, I was very thankful for their kind Communication.

In the Kingdom of *Naples* I saw great Plantations of the *Gossipium*, or *Xylon*, (observ'd by yourself in *Maltha*.) The *Neapolitans* use the *Lanugo* very successfully in the Piles, internally as well as externally, which I had once an Opportunity to remark.

Mr. Ray to Dr. Robinson.

S I R,

THE *Hortus Malabaricus*, which the *Dutch* Herbarists are so busy in carrying on, is too pompous and costly a Work, and not to be purchased by mean Persons. They might have thrust it into a Quarter of the Compass, and render'd it more useful. The like may be said of *Breynius* his Book. Monsieur *Tournefort's History* I long to see, not doubting but it will answer my Expectation of it.

As

As for my intended *History*, I am now sensible I have undertaken a Task beyond my Strength, and yet it is *res integra*. I have not yet proceeded so far, but I can, without Inconvenience, give it over. But yours, and some other Friends Opinions of, and Expectations from me, do inspire me with such Force and Courage, as not to despair of my Abilities, but to contemn all Difficulties, and contend even to excel and out-do my self. I had some Expectation of Dr. Morison's Work; but finding myself much frustrated therein, and likewise a Stop at present put to his Proceedings, tho' it be out of my way, and belong not to my Profession; yet because there is no Man that I know of, of our Nation (as indeed neither is Dr. Morison) competently qualified, either engaged in or designing of such a Work, I was more inclinable to listen to the Solicitations of my Friends putting me upon it: That whereas those of other Nations beyond the Seas are busy and active in this kind, it might appear that the *English* are not altogether idle, or asleep; but do, at least, endeavour to contribute something to the promoting and cultivating so pleasant and useful a Knowledge. I do not intend to begin to print, or so much as procure, or engrave Figures, till I have finished the whole Work, to avoid (as much as may be) Omissions, Misplacings and Appendixes, and for some other Reasons.

Your Remarks upon the *Sapos of Plants* I was much pleased with. I did never reflect upon them, nor consider of how great Use this might possibly be.

I am a great Stranger in the History of the *Jesuits-Powder*, and therefore not likely to give you any Light thereinto.

Your Observation concerning the *Rind of Sevil Oranges* being a Specifick against *Agues*, puts me in mind of a Prescription I had from a Physician in *Nottinghamshire*, to prevent, or divert the Fit of an *Ague*,
viz.

viz. a *Sevil Orange*, entire Rind and all, eaten up an Hour, as I remember, before the Accession.

Though the *Ficus Indica* be so frequently found growing plentifully in *Italy*, that one would be apt to think it were a Native of that Countrey; yet doubtless it is originally a Stranger and an *American*, and was first planted there wheresoever it is found; where probably afterward it might propagate it self by Seed: As is also the *Conyza acris alba Canadensis annua*, which your self and some others have observed to grow as a wild Plant about *Paris*.

Black Notley, June 16. —84.

Dr. Robinson to Mr. Ray.

S I R,

London, August 1. —84.

I Have sent you two *Macreuses*, Male and Female, and hope they will come safe to *Black Notley*. My ingenious and worthy Friend Mr. *Charlton* (now at *London*) procur'd them for me at *Paris*, who hath them both design'd to the Life in proper Colours by the most accurate Hand in *France*. If you saw the Pictures, I believe they would give you a better Insight than these Skins, which are a little broke and chang'd; yet nevertheless your most discerning Faculties may discover that in the Dark which few can distinguish at Noon-day. This *Parisian* Bird (very famous of late) may be no unwelcome Subject, it being in *Lent*, and upon Maigre Days, the greatest Dainty of Convents. I have been told by several of the most learned Priests beyond Sea, that the *Macreuse* was as much a Fish as the *Barnacle*, (and indeed I am of the same Opinion) that the Blood was the same in every Quality with that of Fishes; as also the Fat, which (as they falsely affirm) will not fix,
dry,

dry, or grow hard, but always remains in an oily Consistence. Upon these and other Reasons the *Sorbonists* have rank'd the *Macreuse* in the Classis of Fishes. For the rest, I refer you to my Paper from *Paris*, and impatiently wait for your Judgment, for which I have a particular Esteem.

Mr. Ray to Dr. Robinson.

S I R,

I Received the Box with the Cases of the Male and Female *Macreuse* you were pleas'd to procure and send me ; for which I hold my self very much oblig'd to you.

I had no sooner open'd the Box, but instantly I found that the *Macreuse* was no Stranger to me, tho' unknown by that Name. I was very much pleas'd to be so suddenly rid of my long continued Scruples about it ; and not a little surprized, when I found it to be another kind of Bird than I imagined. A particular Description of the Cock you may find in Mr. *Willughby's Ornithology*, p. 366. of the *English* Edition, among the *Sea-Ducks*, to which Kind this Bird belongs, and not to the *Divers*, or *Douckers*, [*Mergi* or *Colymbi*] as I falsly fancied to my self.

Mr. *Graindorge's* Description which you sent me a Breviat of, I find, upon attent reading and comparing it with the Case of the Bird, and mine own Description, to be very faithful, and sufficient to lead into the Knowledge of it one that had not been prepossessed with a strong Opinion that it was of another Kind, as I have already intimated my self to have been. Had there been but one Word added, that it was of the Duck-kind, I should then presently have apprehended what Bird it was: And yet there was enough
Y in

in the Description, (had I not been blinded with Prejudice, and so lightly passed it over, and not heeded it,) to determine its *Genus*, at least, and to exclude it from those of the *Mergi* and *Colymbi*; and that was, that it had a *flat Bill*, which is a Note common to no other Birds that I know of but the *Goose* and *Duck-Kinds*. Notwithstanding what he saith of the Debility of its Feet unfit for walking on Land, I see not but that it may march as well as the rest of of its Kind; all which have but short and weak Legs in Proportion to the Bulk of their Bodies, and those also situate very backward. What he saith of the Smalness and Weakness of the Wings, and Shortness of their Feathers, is common to many *Sea-Fowl*, viz. the *Tridactylæ* and *Mergi*, which yet by the nimble Agitation of them fly very swiftly and strongly. What he saith of the Mobility of the upper Mandible of the Jaw, I shall not be too hasty to believe, as in a former Letter I remember to have written.

Now though this Bird happened to be known to me by another Name, yet is it so rare and uncommon, that I take it not to have been described by any that have written the History of Birds before; tho' (as I remember) the Name of *Macreuse* is mentioned by *Gesner* or *Aldrovand*, or both. Why they of the Church of *Rome* should allow this Bird to be eaten in *Lent*, and upon other Fasting Days, more than others of this Kind, but especially the *Tridactylæ*, I see no Reason: The Flesh of these last, which live only or chiefly by preying upon Fish properly so called, tasting stronger of Fish than that of any Ducks which feed upon Shell-fish. Many Birds of the Duck-kind, which (as I said) all feed, partly at least, upon Shell-fish, (as Monsieur *Graindorge* found the *Macreuse* also to do) have a delicate and well-tasted Flesh; as for Example, the common *Mallard* and *Teal*: Whereas the Flesh of all those Kinds that feed wholly or chiefly upon Fish, properly so called,

is of a rank, ferine, and pisces Taste: As for Example, that of the *Soland Goose*, the *English Puffin*, and those of the Tridactylous Kind; so that only the young ones of those Kinds are admitted to our Tables. I observed in this Bird, and in some others of the Sea-Ducks, which are much under Water, that they want that Vessel, or *Ampulla*, situate in the very Angle of the Divarication of the Wind-pipe, which, for want of a better, and fitter Name, we are wont to call the *Labyrinth* of the *Trachea*; which, though being common also to the *Colymbi*, which of all Birds dive most and continue longest under Water, we may very probably from thence conclude that the Labyrinth doth not serve them for a Reservoir of Air, to enable them to continue the longer under Water, as I sometimes conjectur'd, but for the intending or modulating of the Voice, seeing in the Plash-Ducks the Females want it. But I am somewhat to seek about the Use of this Vessel, and I think it were worth the while to examine what Sorts of Birds have it, what want it; and in those Sorts that have it, whether the Males only, or in some the Females also. I observed it in the *Mergus cirratus longiroster major*, or the *Dun-Diver*, and that very large, and extended by very strong Bones; and yet I thought my self to have sufficient Reason to judge that Bird to be the Female of the *Merganser*; but I dare not be confident that it is a Female, because of this Labyrinth. And now that I am writing of Birds, I propose it to your Consideration, whether that Sort of Bird, mention'd by Dr. Plot to be often heard in *Woodstock Park*, (from the Noise it makes, commonly called the *Woodcracker*) be not the lesser Sort of *Picus martius varius*? For since the publishing of Mr. Willughby's *Ornithology*, I have observed that Bird sitting on the Top of an Oaken Tree, making with her Bill such a cracking, or snapping Noise, as we heard a long way off, the several Snaps, or Cracks, succeeding

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succeeding one another with that extraordinary Swift-
ness, that we could but wonder at it: But how she
made the Noise, whether by the nimble Agitation of
her Bill to and fro in the Rift of the Bough, or by
the swift striking of the Mandibles one against ano-
ther, as the Stork doth, I cannot clearly discern; but
an intelligent Gentleman, who was very diligent in
observing the same Bird, said it was the former Way.

Black Notley, Aug. 13. —84.

Dr. Robinson to Mr. Ray.

SIR,

London, August 29. —84.

MY own private common Place Books do afford
some odd and (as I think) useful Observations
and Experiments upon Plants, especially those call'd,
and vulgarly esteem'd, *poysonous* ones; which, if ju-
diciously mix'd, prepar'd, and manag'd, may prove
the most powerful and beneficial Medicines in Nature,
I mean internally given; for they may be so order'd
as to work very agreeably, what way soever one
pleases, as by Vomit, Stool, or else by Sweat only,
and Urine, or else insensibly, and not without such
Success, as can scarce be expected from any other
Vegetables, or from any Animal, or Mineral Sub-
stances whatsoever; but I will defer this to a par-
ticular Paper, having not at present my Notes and
Records of my Trials by me.

Mr.

Mr. Ray to Dr. Robinson.

S I R,

Black Notley, Octob. 22. —84.

MUCH Controversy hath of late been concerning the Origine of those *Shell-like Stones*, found in the Earth, either scatter'd or amass'd, in many Places, both in *England* and beyond the Seas: That they were the very Shells of some Sea-fish, or got this Figure by being cast in some Animal Mould, is the Opinion I have declared my self to be most inclinable to, as you may see in my Travels at large from *Page 113. to p. 131.* In Favour whereof I shall add farther,

1. That there are whole Beds of the very Shells themselves unpetrified found in the Earth, and that not only in Plains and Hillocks, such as the *Apulian* about *Andria*, and the *Tuscan* about *Volterra*, may be supposed to be; but in Mountains of a considerable Height. *Christianus Mentzelius*, in his Discourse concerning the *Bononian Phosphorus Lapis*, gives us a Relation of many Beds of them found mingled with Sand in the upper Part of a high Mountain not far from *Bologna* in *Italy*. His Words are these; *Non procul monti Paterno dicto, lapidis Bononiensis patriæ, unico fortè milliari Italico distant, (loci nomen excidit memoriâ) ingens mons imminet præruptus à violentiâ torrentium aquarum, quas imbres frequentes ex vicinis montibus confluentes efficiunt, atq; insignes terrarum moles ab isto monte prosternunt ac dejiciunt. In hâc montis ruinâ, superiore in parte visuntur multæ strages seriésve ex testis conchyliorum omnis generis plurimâ arenâ interjectâ, instar strati super stratum (ut Chymicorum vulgus loquitur.) Est enim inter hæc testarum conchyliorum*

litorum strages seriésve arena ad crassitiem ulnæ & ultra interposita. Erant autem testæ variorum conchyliorum, omnes ab invicem distinctæ, nec cuiquam lapidi impactæ, adeò ut separatim omnia manibus tractari & dignosci potuerint. Effecerat hoc arena pura, nullo limo lutove intermixta, quæ conchyliorum testas conservaverat per multa secula integras. Interea verò diuturnitate temporis omnes istæ testæ erant in albissimam calcem faciliè resolubiles tanquam vehementiâ ignis calcinatæ.

Now, if the Shells themselves, not petrified, be found in such Plenty lying in Beds, and that near the Tops of high Mountains, a great Argument it is, that what Stones we find of like Form, and in like Places, were anciently Shells too. This Argument is so much the more considerable, because it frustrates one main Objection against our Opinion, *viz.* because no Account can be given how the very Shells should be brought to the Tops of Mountains, they being so high above the Level of the Sea: For when as we see the thing done, it is vain to dispute against it from the Unlikelihood of the doing it. But yet we may give the same Account of the Original of this Bed of Shells, perhaps an 100 Foot above the Level of the Surface of the Sea, as we have elsewhere given of that Bed of Sand and Cockle-Shells found in sinking a *Well* at *Amsterdam*, at perchance near 100 Foot Depth below the present Bottom of the Sea; to wit, that both the one and the other were of old Time the bottom of the Sea, and afterwards covered by several Coats, or Floors of Earth, brought down from the Mountains in Land-Floods; the several Beds or Floors to be seen in such broken Mountains, being the several Settlements of particular Floods.

2. Some other Bodies, besides Shells, commonly esteemed Stones, there are found in the Earth, resembling the Teeth, and other Bones of Fishes, which are so manifestly the very Things they are thought only

only to resemble, that it seems to me great Weakness in any Man to deny it. Such are the *Glossopetræ* dug up in *Malta* in such Quantities, that you may buy them by Measure, and not by Tale; and also the *Vertebres* of *Thornbacks*, or other *Cartilagineous Fishes* there found, and sold for Stones among the *Glossopetræ*, which have no greater Dissimilitude to the Teeth of a living *Shark*, or the *Vertebres* of a quick *Thornback*, than lying so long in the Earth, as they must needs have done, will necessarily induce. Now in this same *Isle of Malta* we found also many Shell-like Stones, which why we should not esteem to have been originally the Shells of Fishes I see no Reason: For if in one and the same Place we find many Teeth and Bones of Fishes entire and unpetrified, and likewise Stones exactly imitating the Shells of other Fishes, a great Presumption to me it is that these were originally the Things, whose Shape only they now seem to bear. Neither are these *Glossopetræ* found only in *Malta*, but also in many Places of *Germany*, far remote from the Sea, in a Hill near *Aken*, in so great Plenty, that *Goropius* makes it an Argument they could not be the Teeth of Sharks. *In colle illo* (saith he) *qui Aquis-grano imminet, tantum id genus fuisse piscium quis crederet, quantum de Glossopetrarum copia conjectari deberet?*

3. It seems strange to me, that if these Bodies were formed after the Manner of the shooting or crystalizing of Salts, it should happen that two Shells should be so adapted together at the Heel, and shoot out to the same Extension round, and the upper and nether Valve be of different Figure, as in natural Shells, and that not only in one or two rarely to be found, but in Multitudes of them.

4. Why should not Nature as well imitate other natural Bodies, or their Parts, as the Horns and Hoofs of Land Animals, or the Nuts and Seeds of Plants, as the Shells and Bones only of some Sea-fishes.

5. Were

5. Were these Bodies produced by a Concretion of Salts, it seems strange to me that there should be such great Variety of them, and their Shapes so regular and exactly circumscribed; so great a Diversity of Figures arguing a greater Variety of Salts, or of the Modifications and Mixtures of Salts, than are likely to be found in Nature; and the curvilinear Concretions of Salts never, that I have yet seen, appearing in that Regularity of Figure, and due Circumscription, as in these Bodies; which is an Argument that the Government of some Principle superior to Matter figured and moved in their Formation.

6. Were these Bodies nothing but Concretions of Salts, it seems no less strange, that so many Liquors impregnated with all Sorts of Salts and mineral Juices in all Proportions, having been at one time or other industriously or accidentally exposed to crystallize, and let stand long in Vessels, there should never be found in them any such Concretions: For if any had happened, we should doubtless have heard of them, and the Observers would have improved such an Experiment to the Production of the like Bodies at their Pleasure, which would have been a sufficient Refutation of the Opinion I incline to.

Some of the Arguments against this Opinion admit of an easy Solution. Others I do not see any way as yet to answer, but by granting that many Sorts of Shells are wholly lost, or at least out of our Seas. Others, as the three last of Dr. Plot, do hitherto puzzle me, and put me to a Stand.

As for what Dr. Plot produces out of *Camden* and *Childrey*, in Confirmation of his fourth Argument, viz. that the *Ophiomorphites* of *Cainesham* have some of them Heads. I doubt not but it is a Mistake, proceeding from their Credulity. For Mr. *Willughby* and my self enquiring diligently there after such Stones, the common People affirmed, that there were such found, we not satisfied with their Assertion, but desirous

rous our selves to see them, were at last directed to a Man's House, who was said to have one; to whom when we came, he shewed us the Stone, which indeed at the upper Extreme had some kind of Knop or Protuberance of Stone, but not at all resembling the Head of any Animal. Such a kind of Stone might perhaps be shewn to Mr. Camden, whose Fancy being possess'd with the vulgar Conceit, he might without any strict View, or Examination of it, admit it to be what the Vulgar would have it.

That the Species of *Brontia* cannot be the petrified Shells of *Echini Spatagi*, the Arguments Dr. Plot alledges out of *Aristotle* and *Rondeletius* do not evince. For though in some Seas they may be *πελάγιοι* and *παράνιοι* yet in others are they plentiful enough. In our own Seas at *Llandbwyn*, in the *Isle of Anglesey*, we may reasonably conjecture they are more plentiful than the common *Echini* any where with us; because we found more of their Shells cast up there on the Shore, than of the *Echini* on any Shore about *England*. And though their Bristles or Prickles were indeed but small, yet were they not few, or thin-set, as *Rondeletius* saith.

I thank you for your last Letter, and the Information and Advices therein given. As to the Particular of Figures, I find that others are of a different Opinion from you, looking upon an History of Plants without Figures as a Book of Geography without Maps. A good Figure conveys that to the Mind suddenly, and with Ease and Pleasure; an Idea whereof cannot be formed by the Help of a Description without Time and Pains, and a greater Attention than most Readers have Patience to give it. And for Directions to the best Figures of known and described Plants in other Books; to have recourse to them, would distract and interrupt the Reader, and it's likely but few Readers would have the Books referred to: So that tho' by printing this Work without Figures

it would be render'd of more general Use, being less bulky, and of lower Price; yet inferring some kind of Necessity of purchasing the Books referr'd to, it would occasion as great an Expence as if it had been printed with Cuts. But as for the Danger of losing the whole, that is inconsiderable, it being, perchance, as good lost as found. For my own part, my Motives to attempt the compiling it were the Instigation of some Friends, and a Consideration that no *Englishman* since Dr. *Turner* hath written so of Plants, but that a Man of no more Skill in Botanicks than my self may easily enlarge and amend what they have done: Besides, had they done never so well, their Works are in great Measure useless to Foreigners, as being written in *English*. Dr. *Morison* is a *Scotchman*; so I make not him an *English* Herbarist, nor pass any Sentence on his Performances; *judicio stetq; cadatq; tuo*. But this Paper will hold no more; scarce Room left to assure you that I am, &c.

Sir Hans Sloane to Mr. Ray.

SIR,

London, Novemb. 11. 1684.

I Am heartily glad to hear that you are about so useful a Work, as the *History of Plants* (done by you) will be: I am sure we want it extremely, and that it will be very much esteem'd by the Botanists beyond Sea, particularly Monsieur *Tournefort*, the King's Professor at *Paris*, (with whom I correspond) who told me he desir'd it extremely, and that he had a very great Respect and Honour for you, desiring me to give you his most humble Service; and if you will be pleas'd but to let me know any thing you may have occasion for that can be procur'd at *Paris* or *Montpellier*, I will do all in my Power to help

help you to it. I have several Plants that I brought from both Places; amongst which are several *Non-descripts*: All which shall be at your Service, with what Remarks I made about them, either as to their Growth or Virtues.

The following Plants are thought rare at *Chelsea* and *Fulham*.

Arbor Indica Benzoinum fundens. N. D. It smells very strong, just like Balm.

Cedrus novæ Angliæ. N. D.

Cedrus Bermudæ. N. D.

Cedrus fol. laricis Conifer. B. pin.

Acer floescens, Tradescanti.

Sassafras.

Polypodium Mexicanum. Reccii.

Arbor Amara Reccii.

Lonchitis aspera major Math.

Amygdalus Afr. Fl. pleno fruct.

Holoser. Breyn.

Polypodium Plumosum. N. D.

Pseudo-dictamnium Tingitanum acetabulis Moluccæ spinosæ Mor.

Pinus Hierosolymitana. N. D.

Convolvulus peregrinus fol. hederaceo anguloso. B. pin.

Cedrus ex God. N. D.

Evonymo Affinis Afr. Herm.

Oxyacantha Virgin. N. D.

Styrax fol. aceris Virg. N. D.

Galegæ affinis Hexaphyllos Zeilanica. N. D.

Senecio arboresc. N. D.

Genista Platyphyllos Zeilanica Fl. purpureo siliq. bul-lat. N. D.

Geranium arboresc. N. D.

Hemionites multifid. Park.

Anonymus fol. & fruct. Ribes.

Amomum Novæ Angliæ. N. D.

Arbutus Virgin. N. D.

Nerium Odoratiss. Herm.

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I believe you may have seen most of these, they being Survivors of the last Winter, and probably the most of them will keep out this. Mr. *Watts* having a new Contrivance, (at least in this Countrey) viz. he makes under the Floor of his Green-house a great Fire-place with Grate, Ash-hole, &c. and conveys the Warmth through the whole House, by Tunnels; so that he hopes, by the Help of Weather-Glasses within, to bring or keep the Air at what Degree of Warmth he pleases, letting in upon Occasion the outward Air by the Windows. He thinks to make, by this Means, an artificial Spring, Summer, Winter, &c.

Sir Hans Sloane to Mr. Ray.

SIR,

London, Dec 20. 1684.

THE *Fungus Campaniformis niger multa Sem. plan.* in *se continens* of *Merrett's Pinax*, grows plentifully here in several Places in London, and seems to me very pretty in the Contrivance of the Seed: For within the Cup of the *Fungus*, (which is like a Bell, or rather the Top of *Muscus Pysoides*, or *Pixidatus Ger.*) there lies several Seeds fastened to the bottom of the Cup, by means of a very small Thread, or Fibril, which I suppose might bring the Sap from the Root to the Seed: It has but a small Root, and usually comes out in a round white Tumor from old Wood, which serves to keep up the Sides of Borders: The Rain falling into this Cup, and filling it, the Seeds are heay'd up, and wash'd over, and sow themselves. Perhaps this *Fungus* may have a near Affinity with the common *Muscus Pixidatus*, and this may have some Seed too: This *Fungus* is figur'd by *Menzelius*, in his Description of some Plants in several Places of

Sir Hans Sloane to Mr. Ray. 173

of *Germany*. Its Name, or what he says of it, I do not now remember, not having the Book by me. If you have not taken notice of this *Muscus*, or *Fungus*, I'll observe it more narrowly, and send you its History. Yesterday I was at *Chelsea-Garden*, to see how the Plants were preserved there this cold Weather, and found, that in the Day-time they put no Fire into their Furnaces, and that in the Night they not only put in some Fire, but cover the Windows where they stand with pitch'd Canvass, taking this off, and opening them as much as the Air or Wind permits. There is now in Flower the *Sedum arboresc.* This is the fourth Year of its Age: It is in a Pot, and has continu'd flow'ring for this 4 Months, and is very pleasant. Mr. *Watts* expects to have *Aloe* this Year in Flower, it being already set for it. He has several *Myrtles* not describ'd, a fine *Amaranthus*, of a Crimson Colour, which comes from the *East-Indies*, and some fine *Cyclamini*. When I shall have the Happiness to peruse what you have, or are a writing on any of the Tribes, if I shall have observ'd any thing concerning them not mention'd therein, I shall not fail to give you an Account.

There is a vast Number of *East* and *West-India* Seeds come over this Year: Among the rest, great Store of *Pisum arborescens*, all the Sorts of the *Abrus*, *Tea*, &c. Of all which there are great Expectations; and as they come to Perfection you may expect from me an Account of them. ****

Sir Hans Sloane to Mr. Ray.

S I R,

London, Jan. 31. 1684.

I Should be of the mind, that to supersede the Use of Botanick Authors, and make your History every way compleat, it would be necessary to mention

tion all the Varieties of the *Harts-Tongues*; for Instance, to be found in any Catalogue, or Garden; and so of all other *Herbs*: For it will much please the Humours of Men; and the Possessors or Admirers of such Varieties may take it ill, to have what they esteem so much left out. Therefore, if at the End of each Species there were nam'd all the Variations, I think it would not be amiss, especially considering it would tend to the giving a fuller History of the Plant itself, and that it may hinder Mistakes.

I have two Sorts of the *Bangue*, which were sent from two several Places of the *East-Indies*: They both differ much from our *Hemp*, altho' they seem to differ most as to their Magnitude, I do not in the least doubt but these Sorts of *Bangue* are those with which the *Indians* use to provoke Venery: The Leaves, and all the Plant, not being carefully dry'd, makes a good Description from them impossible.

I have been told by several, that *Muscelin* (so much in Use here for Cravats) and *Calligo*, and the most of the *Indian* Linens, are made of *Nettles*; and I see not the least Improbability, but that they may be made of the Fibers of them.

Mr. Ray's Answer to Sir Hans Sloane.

S I R,

Black Notley, Feb. 11. --84.

YOUR Advice concerning inserting the Varieties of fundry Species, especially such as are esteem'd for their Beauty or Variety, I approve, and shall observe. Howbeit it is not my Intention to supersede the Use of any approved Botanick Author; but my Reasons for attempting this Work were, 1. To satisfy the Importunity of some Friends, who solicited me to undertake it. 2. To give some Light to young Students

Students in the reading and comparing other Herbarists, by correcting Mistakes, and illustrating what is obscure, and extricating what is perplex'd and entangled, and in cutting off what is superfluous, or under different Titles repeated for distinct. 3. To alleviate the Charge of such as are not able to purchase many Books. To which End, I endeavour an Ennumeration of all the Species already describ'd and published. 4. To facilitate the Learning of Plants, if need be, without a Guide or Demonstrator, by so methodizing of them, and giving such certain and obvious Characteristick Notes of the *Genera*, that it shall not be difficult for any Man, who shall but attend to them and the Description, to find out infallibly any Plant that shall be offered to him, especially being assisted by the Figure of it. And, lastly, because no Man of our Nation hath lately attempted such a Work; and those that formerly did, excepting Dr. *Turner*, were not sufficiently qualified for such an Undertaking, and so have acquitted themselves accordingly.

I wish I had Assurance from Eye-witnesses of Credit, that those Sorts of Linen you mention are made of Nettle-Stalks. I have heard and read the like of *Scotch Cloth*, but dare not give Credence to it, because I find not that Dr. *Sibbalds*, in his *Prodromus*, makes any Mention of it; and am loath to put in any thing on uncertain Rumour.

Sir Hans Sloane to Mr. Ray's last Letter.

S I R,

London, March 7. 1684.

FOR the *Polypodium Plumosum*, I can tell you but very little of it, except that it had its Name from its Leaves being like Feathers. Its Place of Growth, and other Things relating to its History, can

can scarce be told by any in *England*: For I think 'tis sent us from *Holland*, and probably may come to them from the *East-Indies*, tho' I cannot say that positively. 'Tis a perennial Plant, and has endur'd this last Winter, without being either in Pot or Green-House.

I was the other Day at *Chelsea*, and find that the Artifices us'd by Mr. *Watts* have been very effectual for the Preservation of his Plants, insomuch, that this severe enough Winter has scarce kill'd any of his fine Plants. One thing I much wonder, to see that the *Cedrus Montis Libani*, the Inhabitant of a very different Climate, should thrive here so well, as without Pot, or Green-House, to be able to propagate itself by Layers this Spring. Seeds sown last Autumn have as yet thriven very well, and are like to hold out. The main Artifice I us'd to them, has been to keep them from the Winds, which seem to give a great additional Force to the Cold, to destroy the tender Plants.

I have one very perfect Leaf of the *Japan Camphire Tree*, and have likewise some of the Root of the *Cinamon Tree*, with a Specimen of the Oil and *Camphire* that is distill'd from it. One thing I would acquaint you with about *Cinamon*, is, that a Gentleman of my Acquaintance having a great Mind to have some of the true Oil of *Cinamon*, he took 12 l. of it, and distill'd it in a proper Vessel, but had no Oil at all. He from thence concluded, that all the *Cinamon* is divested of some of its most fine Particles, before any of it comes to us: And speaking to Mr. *Hermans* on that Subject, I remember he could scarce deny it, altho' his being a Servant to the *Dutch East-India Company* would hinder his telling of that Secret, by which they receive so much Money.

Dr.

Dr. Robinson to Mr. Ray.

S I R,

London, March 10. —84.

I Have enclosed some *Sugar* of the first Boiling got out of the Juice of the wounded *Maple*. Mr. *Ash-ton* (our Secretary) gave it me for you; 'twas sent him from *Canada*, where the Savages prepare it out of the afore-mentioned Liquor, 8 Pints whereof affords a Pound of Sugar. If you have any of these Trees near you, or the *Birch*, or any other weeping Trees, I wish you would make a Trial, proceeding as in the Juice of the Sugar-Cane. The *Indians of Canada* have practised this Time out of Mind: The *French* begin now to refine it, and to make great Advantages.

Mr. Ray in Answer to Dr. Robinson.

S I R,

Y Ours of the 10th Instant I receiv'd last Post, and therein an enclosed Specimen of the *Canada-Sugar*, &c. a thing to me strange and unheard-of before. It were, as you suggest, well worth the experimenting whether the like might be gotten by boiling up the Juices of any of our weeping Trees; tho' I confess I doubt much of the Success. For, first, there are so few Trees common to the new and old World, that it is likely this may be a Sort of *Maple* specifically distinct from any of ours. But, secondly, suppose it be not, it may yield a *Saccharine Juice* in *America*, and yet not in *England*; as we see the *Ash-tree*

A a

yields

yields *Manna* in *Calabria*, and yet not any where else in *Italy* it self. Thirdly, if it be the lesser, or common *Maple*, that is such a nice Tree, that few of the Kind, and those only at some critical Seasons, will bleed with us; so that it is a hard Matter to get any Quantity of their Juice. For mine own part, there are not any of the greater *Maple*, or *Sycamore-trees*, that I know of, growing nearer than half a Mile off us, so that I cannot attend the gathering their Juice, without the Expence of more Time than I can, or am willing at present to spare. The like I may say of *Birches*. We have indeed of *Wallnuts* some growing near us, but I suspect their scrupulous Owners would scarce be willing I should pierce them: So that I doubt whether I shall be able to make any Trials of this Kind; and I make no Question but some Members of the *Royal Society* may have more Leisure and better Opportunities of making them than my self. My Thoughts are almost wholly employ'd at present in the carrying on the *History of Plants*; and I am like him, who said *Pectora nostra duas non admittentia curas*.

As for the *History of Fishes*, I doubt not but you may add to it many Things by me omitted; those Authors you mention having not been seen by me. Dr. *Tyson's* Anatomy of the *Phocæna* I dare say is very exact: But when I begun, that History was not published, at least I had no Knowledge of it, and since have neglected to send for it. I am sensible that the *History of the Cetaceous Kind* is far from perfect; but in my Circumstances it was not easy for me to carry it on any farther. There wants a Description of the Unicorn Fish, of which there are Figures of two Kinds in the History of the *Antilles* written in *French*; but I do not much confide in that Author. There is a prolix Description of the Skeleton of the Head in *Wormius's Musæum*, but too tedious for me to transcribe. I am to seek for Descriptions of many Species

of *Whales* mentioned in Catalogues of them: But I take many of them to be fictitious, and have little Hopes of getting any good Information of them. Both my self and the Publick (if this Work ever be printed) shall be beholden to you for your Contributions to it. If the publishing of it be deferr'd till Mr. *Willughby's* Son comes of Age; I doubt not but he will be at the Charge of necessary Plates; rather than it should be suppress'd. My *Lord Bishop of Oxford* is highly to be commended for his Forwardness to promote any good Design. For this *History of Fishes*, I can warrant it to be as full and perfect, as to the Number of Species, and their Descriptions; (excepting only the *Cetaceous Kind*) as was the *History of Birds*. The *Exanguia Aquatica* I account rather Insects than Fishes; and, besides, neither Mr. *Willughby*, nor my self, had so fully described each several Species, nor ranged them in their Classes, as was necessary for a compleat History of them. But as to *Designs* for the *Cuts*, I have several drawn by hand from the Life, and have already, for every Species, made a Reference to the Place, where the best Figure of it is extant in *Gesner*, *Aldrovand*, *Rondeletius*, *Salvianus*, &c. (I mean in my Judgment) in a Paper I have by me, which you may command.

Black Notley, March 13. —84.

Mr. Ray to Dr. Robinson.

S I R,

A Friend and Neighbour *Apothecary*, whom I employ'd Yesterday, brought me the Effect of his boiling the Juice of the greater Maple. Having boil'd as high as an Extract, he found a whitish Body

180 *Mr. Ray to Dr. Robinson.*

dy somewhat like brown Sugar, and tasting sweet; but withal of a woody Relish, immersed in a Body of the Colour and Consistency and Taste too of *Molosses*. Upon Curing, I do not doubt we shall have, after the *Molosses* are separated, a perfect *Sugar*, but in very small Quantity, not above an Ounce from a Gallon of Liquor. Possibly, nay likely, afterwards, when the Liquor begins to run thick near its ceasing, it will yield a greater Proportion of Sugar. When he hath cured it, I will give you a farther Account of it.

Black Notle, April 1. --85.

Mr. Ray to Dr. Robinson.

S I R,

DR. *Lister's* Opinion, (from whom I had all I know of the *Rudde*) and yours, who have thoroughly examined and compared Figures and Descriptions, concurring, do fully satisfy and convince me, that the *Rudde* is the *Rotcle* of *Baltner*, and not the *Orphus*, or *Nerfling*. I also perceive, that the Fish described by us for the *Orphus*, is no other than the *Rudde*, or *Rotcle*, which I suppose was somewhere in *Germany*, brought us by the Name of *Nerfling*, and under that Name described, which occasioned all this Mistake and Confusion. If I had Mr. *Willughby's* Notes, I doubt not but I could find out a more exact Description of the *Orphus* than will be met with in Authors; for that Fish I am sure was more than once described by us. But it is almost impossible to procure a Sight of them; and therefore we must be content with such a Description of the *Orphus* as we find in *Gesner*. I did describe most of the Animals.

we

we met with in our Travels; but all my Notes of high and low *Germany* were unfortunately lost.

Your Chapter *de Chymicâ Plantarum Analyfi* I have read over with much Pleasure and Satisfaction; in the Title before *Ufu*, I think it will be necessary to add *Resolutarum*, or *Partium Resolutarum*. It is all very good; only in a particular or two, wherein you are positive I am somewhat doubtful, as whether all the Parts into which a Plant is separable by Fire, be transmutable one into another. For though I am of your Opinion, that their immediate component Particles are not primary and indivisible Elements; yet do they contain so many such of one Kind, that I doubt whether the whole Body of one (for Example *Fix'd Salt*) be transmutable into the whole Body of the other; (for Example *Water*;) for if it may, then these being the most simple Bodies we know, one would think that *quodlibet* may be made *ex quolibet*, and that there are no fix'd and indissoluble Principles in Nature, which I think is otherwise demonstrable.

I grant that the component Particles may be separated from each other, and some of them mutually transmuted as inflammable Spirits and Oils, they, after the Separation made by Fire, remaining still mix'd: But from Argumentation we must appeal to Experience. Another thing I suspect is, that fix'd Salts of Plants, were they perfectly freed from all adherent heterogeneous Particles, would not be found to differ from each other in any sensible Quality or Accident: But neither do you affirm so much of fixed Salts so freed; but of them, such as we have them; wherein I do fully agree with you.

Black Notley, April 29. ---85.

Dr.

Dr. Robinson's Answer to Mr. Ray.

S I R,

London, May 9. —85.

AS for the *Transmutation of secondary Principles, or Elements*, one into another, I was tempted to believe it practicable; upon discoursing several times with Mr. Boyle upon that Subject, and upon reading his new Appendixes to the Sceptical Chymist, and to the Aery and Icy *Noctiluca*; where he affirms, that Oils and Water may be wholly chang'd into Earth, tho' never so well purify'd before; and that Salt and Sulphur are transmutable into insipid Water, which also *Tachenius* demonstrates, and Salt into Earth; and this not by the Addition of any new Parts, but by mere Transposition, Division, or some new Modification of the constituent Parts; which making a different Impression upon our Senses, may produce new Qualities or Accidents; but you, being a much greater Master of the *Epicurean* Philosophy than my self, are the best Judge of this. I always fancy'd that there were no fix'd or immutable Principles (I mean Elements) in Nature, as she stands at present, but what may be subject to Changes upon new Motions, or Modifications, unless we suppose pure Atomes without Concretions, and them too under the same constant Laws of Motion. I grant, that Salt, Water, or any other purify'd Element, may contain many Corpuscles of the same Kind; yet these same Particles, by various Transpositions, Divisions, Motions, or any other new Modifications, may put on different Faces and Shapes, and raise in us various Perceptions of different Qualities and Accidents. If this Philosophy be true, then fix'd Salts themselves may differ from each other in sensible Qualities, or
Accidents,

Accidents, according to the Operations, or other Circumstances, tho' they be carefully purify'd. Mr. *Leuwenhoeck* hath observ'd great Variety of Figures in them after they had been diligently freed from adhering heterogeneous Particles; and the very same numerical lixivial Salt will put on different Shapes and Figures; so that it will appear a marine or muriatick Salt, an essential Salt or Nitre of Plants, and also a fix'd alcaly Salt. I have seen great Varieties of Fermentations produc'd, by pouring the same acid Spirit upon many several fix'd Salts prepar'd and purify'd all alike: Their Savors do very sensibly differ in Solutions; and you cannot make *Aurum Fulminans* with so small a Quantity of any fix'd Salt, as that of *Tartar*. I do conclude therefore against you and Dr. *Daniel Cox*, that fix'd Salts do really differ in Qualities and Accidents. However, I submit to your excellent Judgment, and I will not be positive in this or the other Controversy.

Mr. Ray's Answer to Dr. Robinson.

S I R,

YOurs of *May 9.* came to hand last Post, wherein you produce good Authority for what you affirm concerning the mutual Transmutation of vegetable Principles, or immediate component Particles, whereto I can say nothing, unless I had the Author's Books you cite; and perhaps not then neither, unless I should repeat the Experiments myself.

But that there are *fix'd* and *physically indivisible Principles* in Nature, I thus argue.

If

If there be no such, but Bodies are infinitely divisible, how can there be any Constancy in Generations or Productions?

Why are there not infinite new concrete and mix'd Bodies daily produc'd, and as many lost?

For if Bodies be infinitely divisible, Figures being infinite, the Particles whereunto they are divided must probably be of infinite Figures, and few alike; and why should those of the same Figure convene?

How come Bodies to be divisible, even by Fire, into great Numbers of Parts, either really homogeneous, or seemingly so; and not rather into infinite Varieties of Particles; as when a Man with the forcible Stroke of a Hammer breaks, for Example, a Brick, it flies into innumerable Parts of different Figures, perhaps scarce any two like?

How come there to be such great Aggregates of Bodies of the same Kind, as Water, Earth, Air?

Whereas you say, the same Particles, by various Transpositions, Divisions, Motions, &c. may put on different Faces, and stir up in us various Perceptions; I answer, that I cannot imagine any other Difference of Bodies, but what proceeds from the Motions of Figures of their component Particles.

From the Motions of them can come nothing but a greater or less Measure of Fluidity; therefore all other Varieties must arise from their Figures. From the Figures of homogeneous Particles, or such as are of the same Shape, no considerable Varieties can proceed. For, from suppose a Bag of Shot, perfectly spherical and solid, should I shake or move them to the World's End, I should get a Body of no other Texture than I had at first; tho' in Bodies of other figured Particles there might possibly be Variety of Textures, from the *Situs* of the component Particles, in respect of each other. Yet this is not likely, because it is very difficult to set the Particles, all or most of them, in one and the same *Situs* one to another,

ther, and scarce possible to be done but by an intelligent Agent, which yet must be done, to produce like and homogeneous Textures. Therefore the most of these Differences must arise from the Admixture of heterogeneous Particles. The Fire is not such an Analyst, but that it doth communicate Particles to the Bodies it divides or transforms, as we see in *Minium* made of Lead, in which, that some Parts out of the Fire adhering to the Lead, do so transform it, appears probable by the Increase of Weight; and many other like Instances there are.

That fix'd Salts are all alike, (whether they be compound or simple Bodies) I gather from the Impressions they make on our Senses, and from their Operations. Probable it is, that the heterogeneous Particles may, in greater Quantities, and more closely adhere to them in some Vegetables, than in others.

In fine, that there are innumerable concrete Bodies of the same Figure, is evident to Sense in the Crystals of Salts; that these particular Crystals must be composed of like-figured Particles, (one to another, tho' not to the Concrete) and those again of like, *usq; ad minima*, is highly probable, if not demonstrable, in Reason; whereas, were Bodies infinitely divisible, and consequently of no certain Figure, (the *Minima* I mean) I do not see how we could ever come to such regular Concretions, at least to such Multitudes and Masses of them: But that the World must have continued, as the Poets first fancied it, a Chaos. But enough of this.

Black Notley, May 12. --85.

Dr. Robinson in Answer to Mr. Ray.

S I R,

London, May 19. —85.

I Received yours of the 12th Instant, and am sufficiently convinced that there are *fix'd* and *certain Principles* in Nature, and *settled Laws of Motion*: Yet I have some Reason to believe that they are not immutable, but that some outward Violence and preternatural Causes may alter them, tho' they are seldom, or never, mutable in the ordinary Course of Things. If you please, the Transmutation of the Parts of Analyz'd Bodies shall be struck out of the Chapter *de Chym. Plant. Analyfi partiumq; resolutionum Usu*.

Mr. Ray's Answer to Dr. Robinson.

S I R,

LAST Post brought me yours of May 19. In Answer whereto, seeing what you assert concerning the Transmutation mention'd may be true, and is supported by good Authority, and your Opinion; I see no Reason it should be struck out. For those Principles, into which Bodies are immediately resolvable by Fire, being not primary, but compound Bodies, it may consist with my Opinion of certain and fix'd first Principles well enough.

Reading in the Philosoph. Transactions of *March* last your Observations on subterraneous Streams, I find you mistaken in one of your Conjectures concerning Matter of Fact, that is concerning that they
call

call the *burning Fountain*, [*La Fontaine que brûle*] near *Grenoble* in *Dauphine*, which our Curiosity led us to make an excursive Journey from *Grenoble*, on purpose to see. This Place is about 3 Leagues distant from the City up the River. When we came there, we were much deceived in our Expectation; for instead of a burning Fountain, which we dreamt of from the Name and Relations of others, we found nothing of Water, but only an actual Flame of Fire issuing out of a Vent, or Hole, in the Side of a Bank, plainly visible to the Eye, to which if you applied dry Straw, or any other combustible Matter, it took fire presently. I took it to be nothing else but a little *Spiraculum* of a Mine of Coals, or some such-like Substance, fired; and my Reason was, because the Bank, out of which the Flame issued, looked much like Slate and Cinder of Coals. One thing I cannot but admire, that is the long Continuance of this Burning. I find Mention of it in *Augustine de Civitate Dei*, Lib. 1. Cap. 7. *De fonte illo ubi faces extinguuntur ardentes & accenduntur extinctæ non inveni in Epiro qui vidisse se dicerent, sed qui in Gallia similem nôssent, non longè à Gratianopoli civitate.* By which Relation of the good Father, we see how he was abused and imposed upon by Relators that were Eye-witnesses. I my self also was abused in like Manner, and therefore do verily believe there was then no more Fountain there than is now; that is a Fountain of Fire, which from the Constancy and Perpetuity of its issuing out, it may be called. Hence we may learn what Credit is to be given to the verbal Relations of the Generality of Travellers.

Black Notley, May 22. —85.

Dr. Robinson's Answer to Mr. Ray.

S I R,

London, June 2. —85.

I Thank you for freeing me of my Error concerning the *burning Fountain* near Grenoble. Some French, and other Writers, were the Authors of my Mistake. Monsieur Boissieu (a Native of Dauphine, and a learned Person) speaking of the *burning Fountain* of that Countrey, says, *Aqua è rupe procurrit, & ipsa frigida, sed sulphure & bitumine leviter imbuta, cujus superficiei si sulphuratum admo-veris extinctum statim accenditur, ardetq; luculentè; ardet & admota palea, imprimis cœlo nûbibus cooperto.* To save his Credit, we may suspect well enough, that he either speaks of a different Place from that you were at up the River, or else that sometimes of the Year Springs may arise near the Bank, where the combustible Steams may meet with, and run through them, and so produce the aforesaid Phænomena: But this is only a mere Conjecture of mine.

Mr. Ray's Answer to Dr. Robinson.

S I R,

YOURS of the 2^d Instant I receiv'd last Post. In Answer whereto; I approve one of your Excuses and Salvo's for the Credit of the Authors that have written concerning the *burning Fountain*, viz. That probably enough in Winter-time there may issue Water out of the same Vent whence the Fire proceeds; for the Time we saw it was in the Height and Heat

Heat of Summer, viz. about the latter End of *July*. But that the Water hath no Interest in the kindling any thing applied thereto, I am confident; for we saw an actual Flame streaming thence, which must needs kindle Straw, or any other combustible Matter it meets with. And here, by the way, I cannot but reflect upon a Passage I meet with in Doctor *Plot's* Letter concerning Sepulchral Lamps, in the *Philosoph. Transact.* of *December* last. It is this; *Such as the Flame over the Well and Earth about it in one Mr. Hawkley's Ground in Lancashire, that (like the Fire of Plato) only shines, and does not burn.* Herein is contained a double Mistake: For, as I was inform'd by Persons of the greatest Credit and undoubted Fidelity, where the inflammable Steam or Vapour ascended, was no Well at all, but only Water in a Ditch, which dried up in Summer-time, and which the Experimenter, who told me [no other indeed but *Dr. Wilkins*, Bishop of *Chester*] caused to be laded all out; and that when the Ditch was quite empty, the inflammable Steam ascended in like manner as before. Next the Words seem to import, that there is a constant Flame over the Well and Ground about; whereas there is no such thing, but only a Steam constantly ascending, which catches Fire by the Application of a lighted Candle, or any other Flame. Besides, I never before heard, and can hardly be induced to believe, that that Flame only shines, and does not burn, none of my Relators mentioning any such thing, which had been the strangest Miracle of all.

Your former Conjecture, that there may be a different Place, I cannot allow, because those who write of it say it is near *Grenoble*, as this was; and we enquiring upon the Place, heard of no other but this. And that this is that which is usually visited by Travellers, one may know by the Hackney-men, who are very well acquainted with it: And *Golnitz* his Itinerary

Itinerary of *France* notes this for the *Fontaine que brûle*. But enough of this. Another thing I meet with in the same Transactions of Jan. last, in Mr. *Waller's* Observations concerning the *Cicindela volans*, of which I am in doubt; tho' I confess I am more inclinable to believe what Mr. *Waller* asserts, that both Male and Female have Wings, it being more agreeable to the Analogy of other Insects, besides the Credit of the Person, who saw them in Copulation. But then what shall we say to *Carolus Ventimiglia*, to whom I am loath to give the Lye. Indeed, if his Credit were as good as the Relators, *F. Columna*, I dar'd not. *Cùm enim* (saith he) *ex nudis plurimas haberet in vitro inclusas, animi causâ alatam captam iis adjecit, quæ continuò se spectante unam ex nudis subegit, eiq; adhæsit ut bombyx solet, ab eâ deinde divulsâ aliam atq; aliam, quæ sequenti die parere cœperunt, &c.* Besides, how came this to be the receiv'd Opinion before?

Black-Notley, June 5. --85.

Dr. Robinson to Mr. Ray.

S I R,

Septemb. 8. —85.

TAKE a Pilchard by the Tip of the Back-Fin, and it hangs in *Æquilibrio*; but a Herring so held sinks headlong. This was try'd lately.

M. Dodard affirms, that he hath frequently found between the Bark and the Wood of old *Horn-Beam* Trees a very odd *Vegetable Substance*, having black membranaceous Stalks, dividing themselves into many Branches, at the Ends of which there generally grew little Balls, or Buttons, as large as Pease. He
fancies

fancies this to be a Vegetable as much distinct from the *Horn-beam*, as Mistletoes are from the Trees they grow on. M. *Dodard* could only find it in old worm-eaten *Horn-beams*, never in young or sound ones; which makes him conclude that it cannot any ways serve the Oeconomy of the Tree, but that it is a Plant growing up in decay'd *Horn-beams*, exactly between the Bark and the Wood. It is as it were set (*enchassée*) in the Bark, into which it here and there enters, and loses itself. M. *Marchand* found a *Horn-beam* Tree, whose Trunk being cut off, yielded on all Sides a Gum very like to Gum *Lacca*. This Gum of the *Horn-beam* M. *Clos* dissolv'd in Spirit of Wine; the Trunk continued to pour forth many gummy Threds for some Years after it had lain in a low Room. M. *Dodard* afterwards observ'd the same Gum upon many *Horn-beam* Trees. I have extracted this from the *Journal des Sçavans An. 1675. Mens. Decemb.*

Wepfer, in his History of the *Cicuta Aquatica*, proves, that most of the poisonous Plants, as all the *Hemlocks*, the *Hellebores*, the *Solanum's*, the *Napellus*, *Hyoscyamus*, &c. are hot and acrimonious, and kill by saline, fiery, and pointed Particles, which vellicate the Genus *Nervosum*, and either congeal, or else colligate the Blood. The best Way to cure these *Poisons*, is first to give a gentle Vomit, then Oils, Broths, warm Water, and fat Emulsions, till all be evacuated and come away; at which Time *Alexipharmicks*, volatile Salts, and other *Alcalies* and *Anodynes*, are to be given.

I find, upon the Journals of my late Voyage, that I observ'd many People in the Low Countries to make use of the *Turmerick* Root (*Curcuma*) in pickling and preparing their Fish. They told me that it gave the Fish a grateful Taste, and a yellow Colour, which was much esteem'd by them. I think *Bontius* remarks the same thing of the *Germans* and *Poles*.

I travell'd from *Capua* to *Naples* in the Company of an ingenious *Neapolitan* Physician, who entertain'd me with the History of his Country. He assur'd me, that the *Fraxinus*, or *Ornus*, in many Places North-West of *Naples*, afforded *Manna*, of which the Inhabitants made Advantage, tho' it was not so much esteem'd as that of *Calabria*; for gathering and evaporating in the Sun this Saccharine Juice, they always make use of wooden Instruments and Vessels; for it will prey upon Metalline, or bony ones, and so loose its white Colour when concreted. The aforementioned *Neapolitan* inform'd me, that the *Cicada* did feed much upon the *Ornus*; which makes me conjecture, that this Insect (which you have well distinguish'd from our *Grashopper*) does peirce the Tree, and so opens the Passage for the *Manna* to sweat out. I remember, in one of the *German Ephem.* I lately sent you, there is an Account and Figure of an *Indian* Tree, upon which some Insects are said to work, and prepare a Sort of *Manna*. I am apt to believe it may be a Mistake, and that the *Manna* works it self out of the Tree open'd and suck'd by the Insects; but you are best able to judge of these Matters.

Mr. Ray's Answer to Dr. Robinson.

S I R,

Black Notley, Sept. 14. --85.

M. *Dodard's* vegetable Substance growing on the *Horn-beam* Tree, I know not what to say to. I wish it were my Luck to see it. That the same Tree yielded a Gum like *Lacca*, seems to me very strange, that being a Bleeding-Tree, of which I never heard of any that yielded any Gum. Howbeit, *Mr. Marchand* was a very credible Person.

Wepfer's Philosophy concerning poisonous Plants may be possibly true, but it deserves farther Consideration. *Pauca respicientes falsa pronunciant.*

I better approve your Conjecture concerning the *Exudation* of the *Manna*: For I do not observe any kind of *Gum*, or *Resin*, or *concrete Juice*, to issue out of any Tree or Herb, but at some Incision, or Wound, or Rift, or Contusion; and therefore it's likely enough that the *Manna* may issue out of the Vessels containing the Specifick Juice of the Tree perforated by some Insect: Your other Conjecture also concerning the Insect preparing a Kind of *Manna*, is not improbable.

Sir Hans Sloane to Mr. Ray.

S I R,

London, Nov. 10. 1685.

I Wrote a pretty while ago to you about the *Hockesdon* Earth; which, because I fear it miscarried, I now repeat, desiring your Opinion of it.

Not far from *Moorfields*, near the new Square in *Hockesdon*, some Workmen digging a Cellar for a new House in the End of a Garden, when they were about 3 Foot below the Surface of the Ground, found a very strong Smell in the one half thereof. Passing that Way, and finding it very surprizing, and a thing that I had neither heard of, nor seen before, I thought it worth farther Enquiry.

The Workmen having dug a Pit about 6 Foot deep, at about 3 Yards Distance from that End of the Cellar which smelt so strong, I there found three several Layers of Earth one over another, all of them, more or less, having the same Scent. The uppermost *Stratum* was Clay, or, as the Workmen call it, Loom: It did not smell till 3 Foot deep; but then

was very strong, and something noisome. If one look earnestly on some Pieces of this Clay, there are easily discernable several small Quantities of a bituminous Substance, brownish Colour, and tough Consistence. I doubt not but this Substance gives the Smell, and other Qualities, to this Layer. This Clay preserves its Scent a pretty while, tho' by Degrees it grows fainter; and being expos'd to the Air for about a Month, will lose it quite. Eight Pounds of this Clay distill'd in a Retort, plac'd in a Sand-Fire [3d Degree of Heat] yielded one Pound of Phlegmatick Liquor, and six Drams of Oil, of a quite different Smell from any thing I have hitherto met with.

The second Layer was Gravel, which reach'd from 3 and a half to about 4 and a half deep, or thereabouts. It very much resembles the other in all its Qualities, except the Noisomness of its Smell: It loses its Scent much sooner than the former.

The third Layer was an earthy Sand, which smells stronger than the other two, and withal is much more fragrant: The deeper you dig, it smells the stronger. I took 8 Pound of this Layer at 9 Foot deep, and fill'd a Retort with it, and plac'd it as the Clay; but it afforded only 6 Ounces of Phlegmatick Liquor, and 2 Drams of Oil. This sandy loose Earth quits its Scent in about a Fortnight, being expos'd to the Summer-Air.

Considering that Waters owe their greatest Differences to the several Soils through which they pass, I was very desirous to see what Sort of Waters would be produc'd by their being percolated through such a Strainer as this strange Sort of Earth; and desiring the Owner to dig till he should find Water, he accordingly did; and when he came to about 18 Foot deep, Water came in very plentifully; condition'd as follows.

It had at Top a curiously colour'd Film, the Colours of it resembling those of the Rainbow: Under
this

Sir Hans Sloane to Mr. Ray. 195

this was a whitish coloured Water, which upon standing in a Vial some Days, lets fall a brownish Sediment, and by that means becomes diaphanous: It smelt very strong, as the Earth did, was somewhat bitter and clammy, as one may see by putting his Hands in it, and suffering them to dry without wiping. If you put some powder'd Galls into a Glass of this Water, so soon, or a little after you take it out of the Well, it will turn of a purplish red; but if it stand a Day or two, it will not at all.

Several Persons having drunk of this Well about 3 Pints, say, that usually it works about 3 times by Stool, and very much by Urine.

From which I conclude it to be a natural Bitumen, perhaps *sui generis*, that impregnates both Water and Earth. I desire your Opinion in it, and remain,
Ec.

Mr. Ray to Sir Hans Sloane.

S I R,

Black Notley, Nov. 17. --85.

I Now return you many Thanks for the Pains you have taken in assisting me in the carrying on the History that is now before me, and the many Informations and Advices you have given me, and other Contributions you have made thereto, which shall be owned, and gratefully acknowledg'd by me.

I thank you for the Account of the *Hockesdon* Earth, and the rather, because I was lately informed that it was no natural Bitumen mingled with it, but had its Original from the burning of a Painting-Shop standing over the Spot where the Earth was digged up, and that there was no such Earth round about, but just within that Compass. So that as the *Corinthian* Brass was made by an accidentall Mixture

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of Metals melted down and running into one Mass, at the Deflagration of that City; so this bituminous Earth became impregnated by a Mixture of Oils and Colours melted and mixed together, and soaking into the Ground at the burning of that Shop. Whether there be any Truth in this, you can best inform; but I suppose there is none, because you mention no such Thing: And you have done very well thoroughly to examine the Earth, for that probably there may be good Use made of it.

Mr. Cole's Letter to Mr. Ray.

Worthy S I R,

Bradfield, Mar. 27. 1685.

I Have for a long time engaged many Masters of Ships, and others, to bring home whatever they can find for me, as also on both the Sides of *Severne*; and am of Opinion, by what I have this Winter found, that no River in *Europe* doth yield more Variety, especially Sea Animals, great and small, and Minerals; there being very high Land on either Side, high and rapid Tides, often with violent Storms, which have so much gained on the Rocks and Cliffs, that many Fossils and figured Stones are cast out and found on the Shore, especially where at Spring-Tides the Water ebbs far out. Such I have found this Winter, *i. e.* figured Stones, which would put you out of all doubt that there are many Varieties of naturally formed Stones, which never were either Animals or Vegetables or any Parts of them, not only because no such Shell-fishes were ever found, so far as appears by any known Authors, or the Collections that I have seen or heard of, (and to suppose any Species of Creatures to cease cannot consist with the Divine Providence, and is contrary to the Opinion

nion of all Philosophers as well as learned Divines;) but it doth evidently appear by the Figures of some of those I have found this Winter, that they were never capable of being living Creatures. As among others, to instance in one of those which can be reduced to none but the *Ophiomorphites*, which I found growing between the thin Plates of a kind of brittle-blue Slate in large Rocks, some a Furlong within full Sea-Mark, and some where the Water comes not at the highest Tides, only in great Storms where the Waves break, and sometimes dash when forced up by the Wind. These being broken with a convenient Tool, will shiver all into very thin Plates, between which I found an abundance of those Stones, as brittle as the Slate in which they grow, and of the same Consistence; yet so thin, that the broadest, being about 4 Inches, are not so thick as a Half-crown Piece. Some not half an Inch, and as thin as a Groat, and so proportionably up to the largest, cover'd with a Superficies as thin, and exactly of the Colour of Silver Foil: And where the Sea Water washeth them, and they are exposed to the Sun and Wind, when the Tide is gone, are tarnished, and appear of a Gold, Purple, blue and red; as any thing on which Silver Foil is laid, when exposed to the Sun, Wind and Weather, will do in a considerable time. These have the same spiral Figures, and as regular as the other *Serpent Stones*; and with a Knife being taken off, leave the Impressions on both Sides of the Slate. In such Rocks of Slate, but much harder, I found (and employed Men with Tools to dig them out) some of those Stones of another kind, thick in Proportion to their Breadth, from an Inch to 28 Inches broad; and the last broadest one was at the great End (on which some Authors have fabulously reported the Head to grow) 6 Inches thick, all of them covered over with a white Scale, which may be taken off, one Coat under another, as Pearls, or the Shells
of

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of some Fishes. I saw some Impression of others near as big as the fore Wheel of a Chariot. I could not get one of those large ones whole, but brought it home in Parts, and have promised a good Reward to the Labourers I employ'd, if they dig out and send me a whole one, which will be a rare Sight, the Magnitude, Colour, and Figure consider'd. I found other Stones something resembling a *Nautilus*, but so much differing from those we know, that I am confident they were never Shell-Fishes.

Mr. Johnson to Mr. Ray.

S I R,

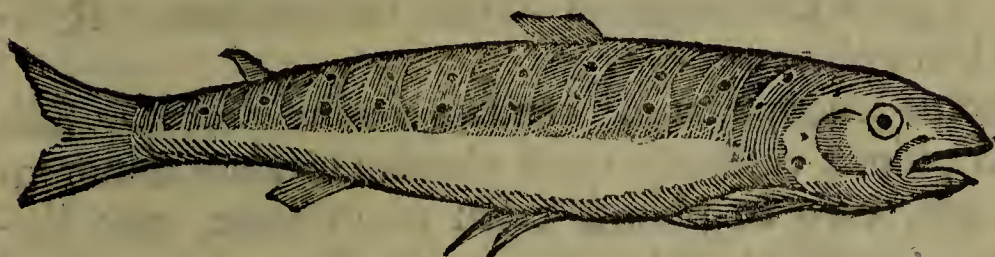
Brignall, May 7. --86.

I Have enclosed a Draught of our *Branlin* which I took from the Fish, which now I know comes too late; but I hope you found the other I sent you before, which was far more exact, being done by an excellent Artist. On the back Side you have the Description of a new *English* Bird, it agrees in material Points with your *Garrulus Bohemicus*; and therefore I imagine it to be of that Sort, for some Birds vary much in Colour. They came near us in great Flocks, like *Field-Fares*, and fed upon *Haws*, as they do. I cannot but think that the Wars in those Parts have frightened them thence, and brought them hither this Winter; (which with us was above measure plentiful in *Haws*) for certainly they are not Natives. And now 'tis in my Thoughts, I would intreat you, at your best Leisure, to let me know if you can tell any thing certain concerning the *Birds of Passage*, whither they go, when they leave us? If it be granted that the *Swallow* Kind, and such small Birds, do hide themselves in Rocks or Trees, yet *Storks*, *Soland-Geese*, and Birds of great Size, cannot possibly do so.

The

Moon is too far a Journey, and a New World in the South temperate Zone methinks they can hardly reach, seeing *Wild-Geese* from *Ireland*, and *Wood-Cocks* from *Norway*, come often so tired to us: And yet how they should 'scape the Eyes of so many diligent Enquirers, both by Sea and Land, especially since our Increase of Trade and Navigation, is to me a Matter of no less Difficulty.

Mr. Johnson's Descriptions.



Salmoneta. A Branlin.

Longitudo semipedalis, capitis gracilitate, dorfi colore cærulescente, & caudâ furcatâ Salmonem æmulatur; linea lateralis 6 vel 7 notulis rubris insignitur. Pars superior ad dorsum usq; nævis etiam nigricantibus aspergitur. Per latus umbræ 7 (plus minùs) nigricantes descendunt, quibus facillimè à Truttâ distinguitur. Oculi ampli, aurei, protuberantes. Pupilla cærula. Os parvum denticellis repletum. Pinnæ, quales in Salmonum genere, in ventre rubescunt. Branchiarum operculum notâ nigrâ quandoq; duabus maculatur.

*Capta in Teesâ flu. Mart. 10. 1686.
è vivâ delineavit R. J.*

An Garrulus Bohemicus, five Ampolis.

MErulâ paulo minor, rostrum nigerrimum, passeris magnitudine, caput cristâ longiusculâ decoratum quæ versûs rostrum ex castaneo rubet, retro cinerescit. Sub mento macula nigra, ampla, supra oculos linea etiam nigra retrogreditur. Totum dorsum leucophæum, versûs uropygium tamen magis cinerescit. Cauda quæ 12 pennis constat, imâ parte cinerea, mediâ, nigra: extima pulchrè lutea: Alæ nigricant, è rectricibus 1^{ma} tota nigra, 2^{da}, 3^{tia}, & 4^{ta}, exteriori margine in album definit, 4 proxima in luteum deinde 8 in album, adeo tamen ut ex his 5 interiores appendices habent cinnaberinos. Alarum tegetes exteriores in album terminantur. Reliquæ leucophææ.

Pectus leucophæum, caudam versûs albicat. Sub caudâ plumæ castaneæ quasi alteram caudam minorem efficiunt, caro & plumæ tactu mollissimæ, nec linguam, nec pedes, nec rostra, nec barbam picorum vel iungis habebat. Gregatim volitant.

Capt. mense Martio 1688.

I saw another, perhaps the Female, like the former in all Things, save that the Breast and Belly were all of one Colour (leucophæous) not growing whiter toward the Tail, and that the two utmost Rectrines had no white at all, nor scarce any Appearance of Yellow in the rest, and but 4 tagged or pointed with Crimson, and which I did wonder at, there were indeed but 10 Feathers in the Tail: Whether this was the natural Number, or that two had been shot away, I could not satisfy my self.

Sir

Sir Hans Sloane to Mr. Ray.

S I R,

London, Aug. 10. 1686.

IN turning over my *Paris Garden Catalogue*, I found a *Catalogue of Nondescript Plants* growing there in the Year 1683. I saw and took notice of them there, most of the Names being given by Dr. *Tournefort*, whom I expect to see here shortly. The *Catalogue* I transmit you as follows.

Abrotanum fœmina foliis crethmi. D. Fagon.

Abrotanum fœmina foliis rorismarini. D. Tournefort.

Betonica purpurea spicâ molliori, longiori, & serius florente. Tournefort.

Brunella Alpina folio angusto integro. D. Tournefort.

Caucalis elegantissima Pyrenaica. D. Fagon.

Cerinthe major Alpina. Tournefort.

Chamæsyce foliis hirsutis. Tournefort.

Cicutaria latifolia fœtida. D. Fagon.

Cucumis Asininus folio Anguriae. D. Fagon.

Daucus Pyrenaicus odore Citri. D. Fagon.

Echium Creticum latifolium rubrum. Tournefort.

Erysimum siliquis quasi implicitis. D. Fagon.

Ferula folio latissimo. D. Fagon.

Horminum Pyrenaicum Anguriae folio viscosum. D. Fagon.

Laserpitium umbellâ contractâ & concavâ. D. Fagon.

Meum adulterinum longiori folio. D. Tournefort.

Nasturtium aquaticum maximum. D. Fagon.

Oenanthe capitulo longiori & hispidiore. D. Tournefort.

Ruta arborea latifolia. D. Tournefort.

Salvia Cretica coccifera. Tournefort.

D d

Scabiosa

Scabiosa folio Dipsaci. Tournefort.

Senecio Lamii folio. D. Fagon.

Seseli Pyrenaicum Thapsiæ folio. D. Fagon.

Succisa angustifolia Alpina. Tournefort.

Stachys Pyrenaica. D. Fagon.

S—— Cretica major. Tournefort.

Tithymalus Ranunculi radice. D. Fagon.

In our Simpling Journey in *Sheppey* we found a *Perennial Kali*, differing something from that on the Mediterranean Shore, in that it creeps, whereas the other is erect: Then the green Tops are thicker than that on the Mediterranean Shores; and Mr. *Watts* assures me it is a Perennial: It grows near *Kings-ferry* in *Sheppey*, where also is cast upon the Shore the *Fucus Spongiosus nodosus* Ger. *emac.* In the same Place in the Ditch grows plentifully an *Atriplex maritima folio sinuato candicante angusto.* It seems to differ from the common *Sinuato candicante pin.* as the common *Maritima* from the *Sylvestris altera.* I send you down Specimens of them, and *Axtius de pice conficiendâ*, and *Arboribus coniferis*, by the first Carrier; as also that *Fucus* I formerly told you of, to look like a Honey-comb, which I found cast upon the Shore on *Sheppey*, as well as at *Nesson.* There is in Town a *Bark* come from *Virginia*, which has Prickles, the Basis of which resemble petrified *Malta Teeth*: It stings the Tongue in a very extraordinary Manner; and he that brought it, says it grows plentifully on the Shore there. On *Sheppey*, searching for the *Copperas-Stones*, or *Pyrites*, I found that the most Part of those, taken up in that Island are after North-Easterly Storms, that they are beat up by the Waves, and taken up at Low-Water. Among others I found one something extraordinary. It had been a *Buccinum* petrified, and after that turn'd into a *Pyrites.* So that you might see every thing in it as in a *Pyrites*, viz. Weight, Colour, &c. I leave you to judge whether or no the Difference

Sir Hans Sloane to Mr. Ray. 203

Difference between the *Atriplexes Maritimæ* and *Sylvestres* may not be occasioned by the differing Soil: For considering that both the *Maritimæ* are less in their Leaves than the *Sylvestres*, 'tis somewhat probable that the brackish Aliment of the one, does not mollify, nor distend the Cells of the Leaves so well as the other: But that's but a Conjecture. I wish you all Health and Happiness, and am, &c.

Dr. Robinson to Mr. Ray.

SIR,

London, Aug. 14. —86.

THE other Day I and Mr. Doody (an Apothecary here) had Occasion to go 5 or 6 Hours down the River, we found many rare Plants upon the Chalk Hills and Marshes near *Gravesend*; but they are all mentioned by, and very well known to you. We observ'd in the long broad Vesicles, at the End of the Leaves of the *Fucus Maritimus latifolius vulgaritissimus*, many small dark round Bodies adhering to the inner Membranes, which contain'd a mucous Liquor; whereas the round Bladders in the other Parts of the Leaves were void of Liquor, and of those dark solid Globules, which gave Mr. Doody and myself reason to fancy that this Plant abounds with Seed, which upon drying, disappears: And this seems to me to be no extravagant Conjecture, for I begin to conclude, that the Seed of this Plant (and others of the same Class) may in time appear as manifest as the Seed of the Capillary Herbs.

Mr. Johnson to Mr. Ray.

SIR,

I Did indeed once imagine a Possibility of knowing the *Medicinal Virtues* of *Plants* by their *Signatures*: Which Project, if it could have been brought to Perfection, might have been of great Use to Physicians, who know nothing of them but by quack and second Qualities. I was hereunto encouraged by the unaccountable Variety of Colours, Forms of Seeds, and Seed Vessels, especially Number, which I found the *Conjugatæ* religiously to observe in some Plants to the very Division of the Pointell. Besides the *Galeatæ* of sweet Smell being most what cardiac, the *Scandentes* often cathartick, those of a lucid Flower, poisonous, &c. Farther, I did consider, that the *Texura*, or general Terms of Virtues, were not well ordered, but often did interfere one with another; and that if they were reduced to a Method truly natural, Plants might be accommodated to them more easily. These Considerations did some time encourage me to observe the Analogy of Plants of the same Kind, and their minute Differences, not without great Pleasure and Delight. But when I found Dr. Grew had hit upon the same Notion, and laid his Enquiries much deeper than mine, viewing the internal as well as external Parts of Plants, and yet could conclude nothing, I quite desisted from farther Search, despairing to meet with what others with more Diligence had not found.

Brignall, Oct. 29. --86.

Dr.

Dr. Robinson to Mr. Ray.

S I R,

London, January 29. --8⁶.

THE *Willows* will sometimes drop, and run prodigiously in dry and clear Seasons at Noon-day, as I have been told by several of good Credit. In the Year 1685 the *Willows* wept so fast at Noon-day in the Month of *March*, near the Neat-houses, that Dr. *Plucknet* passing on the Road, was extremely surpriz'd, and almost wet to the Skin; yet it had been no Rain for many Weeks before, and the Air and other Trees were very dry at the same time. I have heard this Relation confirm'd by other Persons that observ'd the same. Trees may now and then be subject to Bleedings, Sweatings, Catarrhs, and other Extravasations: Yet this is no very strong Argument (I confess) for the *Arbor aquam fundens*, because it is said to observe certain Periods.

The *Manchinelo* is not only mentioned by *Hughes* and *Lyon*, but *Rockefort*. I think he hath misplaced it; for as I remember he hath put it amongst the Animals. A Planter tells me that they use the Wood for Beds and Floors, because those Insects (which eat and destroy all their other Timber) will not touch this. Their Beds and Floors, and other Wood Work, suffers extremely by an Insect, unless they are made of the *Manchinel* Wood.

The *Cochinele* is a dry'd *Hexapode*, that runs up and down a *Ficus Indica*, and turns into a *Lady-Cow*. I took it once for a *Kermes*, or *Coccus* of an *Opuntia*, or *Tuna*.

Sir

Sir Hans Sloane to Mr. Ray.

S I R,

London, Jan. 29. 1586.

I Have talk'd a long while of going to *Jamaica* with the Duke of *Albemarle* as his Physician; which if I do, next to the serving his Grace and Family in my Profession, my Business is to see what I can meet withal that's extraordinary in Nature in those Places. I hope to be able to send you some Observations from thence, God Almighty granting Life and Strength to do what I design: But our Voyage having been put off so often, I doubt it very much. I am glad to hear by Dr. *Robinson* that your elaborate and excellent Work goes on so fast, as to begin already to print the Trees. Great Feuds are like to be between the *French* and our Philosophers about the *Magnitude* of *London* and *Paris*; ours alledging that *London* is as big as *Paris* and *Rouen* both together; and being urg'd by them to give some Proof for what they say, I intend to print Certificates from *Hearthmen* here, and ingenious Men there, that in *London* are 100000 Houses, and in *Paris* but 24000. There is no less a Dispute on another Account. The *French* Ambassador to the King of *Siam* carrying a Jesuite with him, he made several Observations, and found that that Kingdom was misplac'd in Longitude, to the East, about 22 Degrees; but Mr. *Hally* says that he long ago found that out, and gave an Account of it in the *Transactions*. But I am mistaken if there were not something rectified about that a great while ago by some learned Men. I suppose you have had an Account of Dr. *Magnol's* new Appendix: It's but small, and less worth than I thought; for when I was there he design'd to simple the *Pyrenees* and *Hortus Dei*, or Mountains

Mountains of *Auvergne*, where are many Curiosities. We are now mighty solicitous about the *Jesuits-Bark*, or *Cortex Peruvianus*, it being so good a Drug, that they begin to adulterate it with *Black-Cherry*, and other *Barks* dipt in a *Tincture* of *Aloes*, to make it bitter; but the Bitterness of the adulterated Bark appears upon its first Touch with the Tongue; whereas the other is a pretty while in the Mouth before it be tasted. I am, &c.

Dr. Robinson to Mr. Ray.

S I R,

London, May 21. —87.

MOnsieur *Bernier*, who passed the Red Sea into *Arabia*, doth affirm in a private Letter, that the *Arabs* assured him that the *Coffee Fruit* was sown every Year under Trees, up which it did climb and run; from which he concludes it to be a Species of *Convolvulus*. I think he might as well have concluded it to be a *Phaseolus*, or some other *Scandent Legume*. If M. *Bernier* was truly informed of its annual Sowing and Climbing, then *Alpinus* never saw the true *Coffee Plant*. The *Arabians* are as careful in destroying the germinating Faculty of the *Coffee Fruit*, or Seed, by boiling or burning, as the *Dutch* of the *Molucco's* are in their *Nutmegs*. I have spoke with several curious Persons that have been several times in *Ægypt*, and they all said that they never saw the *Coffee Plant*; neither (as I remember) did *Bellonius* ever meet with it in that Country, or *Arabia*; for the *Coffee* is said only to grow in that Part of *Arabia* that lies within the Tropick.

I have examined many *Coffee Berries* (as they call them) here at *London*, and am almost persuaded by my own Observation, that they are neither *Berries*,
nor

nor the Seeds of any *Convolvulus*, nor of any *Legume*, but are rather of the *Nut-kind*: The entire Fruit is covered with two Skins, being round on one Side and flat on the other; the exterior Skin, or rather Shell, (being as thick almost as that of a Pistachoe) is of a dark Colour; the second, or interior Membrane, that covers the Kernels, is much finer, and of a yellowish white Colour, as the Kernels themselves are. Under this second Skin lies generally two Kernels (sometimes one) round on one Side, and flat on the other: On the flat Side of the Kernel there is always a Slit, or a Mouth; so that every Kernel doth exactly resemble a *Concha Veneris*. The Fruit doth generally come to us decorticated; but I finding some entire, have made this Description.

Sir Hans Sloane to Mr. Ray.

SIR,

London, June 21. 1687.

I Send you here inclosed the Specimen of a Plant growing on *New-market Heath*, and in *Surry*, known by the Name of *Star of the Earth* in those Parts. It is particularly taken Notice of on the Account of its extraordinary and admirable Virtue in curing the *Bitings of Mad Dogs*, either in Beasts or Men. One of his Majesty's Huntsmen having prov'd it a great many times, gave the King his Way of using it, which was an Infusion in Wine with Treacle, and one or two more Simples. His Majesty was pleas'd to communicate it to *Gresham College* to the *Royal Society*; and no body knowing the Plant by that Name, some there present confirming its Use in that Disease in some Places of *England*, and procuring the Herb it self, it is as little known here as if it had come from the *Indies*. I told the Society.

I would

I would let you have this best Specimen of it, which I question not but 'tis known to you. If you please to give your Sentiments about it, you'll extremely oblige, &c.

Mr. Ray's Answer.

S I R,

I Receiv'd your Letter with the Specimen enclosed, which seems to me to be the *Sesamoides Salamanticum magnum* of *Clusius*, or *Lychnis viscosa flore muscoso* of *C. B.* which I have observed to grow plentifully upon *Newmarket Heath*, that Part I mean that is in *Suffolk*; for on *Cambridgeshire* Side I have not found it. I wonder it should have such a Virtue as you mention; but it seems it is well attested. *Dr. Hulse* writes to me he finds it in *Graves Farrier*.

If you go to *Jamaica*, I pray you a safe and prosperous Voyage. We expect great Things from you, no less than the resolving all our Doubts about the Names we meet with of Plants in that Part of *America*, as the *Dildoe*, *Mammee*, *Mangrove*, *Manchinello*, *Avellane purgatrices*, the *Sower-sop*, and *Custard-apple*. Of most of which tho' I am pretty well informed and satisfied by *Dr. Robinson*, yet I shall be glad to be either confirmed, or better informed by so knowing and curious an Observer as your self. I should be glad to know what manner of Fruit the *Mandioca* bears; for (whatever some have written) that it is not without, I am confident. You may also please to observe whether there be any Species of Plants common to *America* and *Europe*, and whether *Ambergrise* be the Juice of any Sort of Metal or *Aloe* dropt into the Sea, as *Trapham* would have it. What Kind of *Arundo* it is, the same Author calls the *Dumb-*

cane; as also what his Animal Seeds may be. The *Shining-Barks of Trees* which he mentions deserve Observation, because I find nothing of them in other Writers. I shall not instance in more Particulars. I wish your Voyage had so long prevented the Publication of my History, that I might have been satisfied and informed by you of these and a thousand other Particulars, and had so great an Accession of new and non-descript Species as your Inquisitions and Observations would have enriched it withal. I take Leave, and rest, &c.

Rich. Waller *Esq*; to Mr. Ray.

SIR,

London, Feb. 4. 1687.

I Thought it might not be an unacceptable Communication to tell you, that being this last Summer at *Keinsbam* in *Somersetshire*, and making a Search after the *Cornua Ammonis*, I found (amongst several of the ordinary *Snake-Stones* in which the Shelly Diaphragms were very visible) one of the true *Nautilus* Shape, covered in some Places with a Shelly Incrustation, with the Diaphragms to be seen to the Centre of the *Voluta*; and in each Diaphragm the Hole by which they communicate with one another, by a String, or Gut, in the Fish. This was of a very hard Stone, and large Size, weighing at least 28 Pound, tho' some Part was broken off.

Mr.

Mr. Waller to Mr. Ray.

S I R,

Since one of the chief Ends of an *Herbal* is thereby to attain to a true Knowledge of Plants, I have adventured to propose my Thoughts to you, how by a few *Tables*, with *Iconisms*, one wholly ignorant in Plants may know how to find any unknown Plant, together with the Help of your Method and *Tables*, in your most exact and elaborate Treatise of Plants, lately publish'd. My Thoughts in short are these.

I would, according to your general Table of Herbs, (inserted at Page 58.) take the two first Divisions, *Imperfect* and *Perfect*; giving the Figure of any one *imperfect* Plant, as of a *Fungus*, or the like. Of a *perfect* one, I would do the same; under the perfect another Figure of the minute seeded, *viz.* a *Capillary*, with a larger seeded Plant. This should be my first Table. In the second, coming to the larger seeded, I would give the Figure of a Seed coming out of the Ground with two Lobes or Seed-Leaves, beside the Plant-Leaves; (referring the *Unifolia* to another Table, as also all larger Plants or Trees;) under this I would represent an imperfect, or staminous Flower, and against it a perfect or leafy Flower, both compound and simple: And so on throughout all the Generick and Specifick Divisions in several Tables; which I suppose need not be many, with References to the Books, and Chapters of your Treatise. The Use of them will be this: Taking any unknown Plant, my first Enquiry must be whether it has a Seed or no: If a Seed, whether small or large? If

large, whether Bivalve or not, &c.? By which Method proceeding, I shall at last be brought to find the very Plant it self, and the Place where described at large in your Book; my Design in these Tables being only to give an Idea of the Difference of Plants by *Pictures*, (the Representations of Beings) rather than by *Words* (the Representations of Pictures.) This I submit to your Censure, before discovering it to others, requesting your Thoughts upon it; for it is very possible, that being so unknowing as I am in Plants, I may frame an Image to my self of that, which, brought to the Test, will prove a mere Chimaera. If so, pray pardon my Rashness, and accept of my real Desire of advancing Knowledge.

I think fit to communicate, that being this last Autumn at *Bristol*, in *August* the Tide brought in floating some of the vesiculiferous *Sea-wrack*; the Bladders were some filled with Air, some with a slimy Water; and in some I found a round (as I suppose) Seed, thinly dispersed in a tenacious Matter. They were somewhat smaller than Rape-seed, and of a brownish Colour. This, if a new Discovery, may be farther prosecuted. Thus having already troubled you with too large a Letter, I beg Leave to subscribe myself, &c.

London, April 5. 1688.

Although the Plants mentioned in this following Letter of *Mr. Lawson* may be met with in *Mr. Ray's* Books, yet there being many of the Northern Plants put together in Alphabetical Order, with the Places where they grow, I thought it might be acceptable to the Northern Botanists to publish the Letter as I found it.

W. D.

Mr.

Mr. Tho. Lawson to Mr. Ray.

Mr. Ray, Great Strickland, April 9. —88.

A *Cetosa Scutata repens*, C. B. *Acet. rotundif.* Westmerlandica Mor. by Buckbarrow Well in Longsle-dale: Also on little Harterfell Crag, copiosè. Westmerland.

Adiant. petr. perpusillum, sc. on Buzzard rough Crag, close by Wrenose in Westmerland. I was with Ja. Newton when 'twas found.

Alchimilla Alp. quinquesolia, by Buckbarrow Well plentifully, as on the Rocks between Thornwhait and Mardale, copiosè West.

Allium Mont. bicornè is doubtless *Al. Syl. bic. pur.* prol. Chab. in Trout Beck Holme by Great Strickland, Westmerl.

Alnus nigra baccifera J. B. in Thorny Holme in Whinfield Forest, Westm.

Saxifr. Gram. sc. Cat. Cant. called in your Hist. Sax. Gram. pusil. fl. parvo tetrapetalo. Hereof I found another Species, *Foliis brevioribus crassioribus & succulentioribus*, on Whinnyfield Bank, by Culler Coats by Timmouth in Northumberland.

Anagallis aquat. minor fol. subr. C. B. *Anagal. aquat. min. fol. oblong.* C. B. Both fl. albo, about Shap, in Westm.

Anag. aquat. rotund. Ger. *Samolus Valerandi.* at Marshgrainge in Furneis, and between Bare and Pulton, nigh Lancaster, on the Sea-Bank.

Anchusa degener fa. *mil. solis*, on Lansmoor near Great Strickland. 'Tis not plentiful with us, Westmerl.

Androsæmum vulg. Park. in the Lady Holme in Winander Mear, Westm.

Apium palustre seu off. C. B. near Cartmall Medicinal Well on the Marsh Ditches, Lancashire.

Armeri. Prat. Ger. fl. albo at Orton, Greatstrick, Westm. and by Penigent in Yorkshire.

Aria

214 *Mr. Lawson to Mr. Ray.*

Aria Theophrasti, Ger. *Witherslack*, *Consfick Scar*, *Silverdale*, *Arnside*, Places in *Lanc.* and *Westm.* where they call it *Chefs-Apple* and *Sea-Oulers*. 'Tis *Sorbus Alpina*, J. B.

Asplenium, J. B. on *Troutbeck Bridge* near *Winander Mear*, copiosè *Barba Neptuni*, Mrs. *Wardè* of *Gisborough* of *Gleinelayne* in *Yorkshire*, first observed thi and called it *Sea-Beard*: She shew'd it me, and afte to Mr. *Newton*, who called it *Bar. Neptuni*. She very knowing in Plants.

Betonica aquat. Ger. at *Allythwait* nigh *Cartmal*, *Lanc.* copiosè.

Bifolium minimum J. B. by the *Picts Wall* in *Northumberland*.

Bistorta minor, Ger. at *Crosby Ravensworth* in *West.* copiosè.

Bryonia alba, Ger. near *Darlington*, all along the *Horse-way* to *Thornton* in the *Bishoprick* of *Durham*, copiosè.

Buglossum luteum Ger. betwixt *Stockton* and *Norton*, in the *Bishoprick* of *Durham*, plentifully.

Bursa past. minor. *Nastur. petr. Tab.* by *Common Holme Bridge*, near *Clibburn* in *Westmerl.*

Campanula Cymbalarie fol. Ger. *Emac.* In *Bagley Wood* near *Oxford* I observed it.

Cardamine, Ger. *fl. pleno*, on *Little Strickland Pasture*, *Westmerl.*

Carduus nutans, J. B. by *Hardindale Nab.* *Westmerl.*

Card. stellat. Ger. betwixt the *Glass-houses* and *Dents Hole*, nigh *Newcastle* upon *Tyne* in *Northumberland*.

Card. monstrosus Imperati, in a *Lime-stone Quarry* in *Great Strickland Field*, *Westmerl.*

Caryophyllata purpurea prolifera fl. amplo, by *Great Strickland*, *Westmerl.*

Caryophyllus mar. minimus Ger. in *Bleaberry Gill* under *Hinckell-Haugh*, at the *Head* of *Stockdale Fields* in *Craven*, *Yorkshire*, far from *Sea*.

Caryophyllus

Caryophyllus Virgin. Ger. on a Sandy Hill, a little below Common Holme Bridge, where the Water is crossed, near Great Strickland, Westmerl.

Catanance leg. quorundam, J. B. between the Glass-houses and Dents Hole, nigh the North Shore House by Newcastle upon Tyne, copiosè.

Centaureum luteum persol. C. B. in many Places by Worcester and Gloucester.

Centaureum min. C. B. fl. albo, by Cartmall Medicinal Well, Lancash.

Cerasus syl. fructu min. cordiformi Ph. Br. nigh Stockport in Cheshire, at Bery or Bury in Lancashire, at Rosgill in Westmerl. In all these Places 'tis called Merry-tree. I could observe no Difference from other Cherry-trees, save in its small cordiformous Fruit.

Chamæcistus vulgaris fl. albo. On Gogmagog's Hill I gather'd it.

Alysson Dioscor. montanum Col. at Lartington in York-shire, near Bernard-Castle in Buckham, belonging to Sir John Lowther, Westmerl.

Chamæmorus Ger. between Bannisdal Head and Water Sledale, as on Cross-fece, Westmerl.

Christophoriana Ger. among the Shrubs by Malham Cove, Yorkshire.

Cochlearia marina fol. Anguloso parvo, in the Isle of Waney, Lancash. I purpose soon after Pentecost to send fair Samples and Seeds. I saw nothing to distinguish it from the rest but its little corner'd Leaves.

Conyza major Mat. sc. J. B. by Cartmall Medicinal Well, Lancash.

Conyza Cær. acris, C. B. on the old Walls by Sawley Abby, Lancash.

Cotula non foetida pleno fl. at Great Strickland, Westmer.

Cotyledon hirsuta, P. B. by Buck-barrow Well in Longsledale, Westm. copiosè.

Critbnum

Crithmum mar. ſpinoſum ſc. Park. at Roosbeck in Low-Furneis, Lancaſh.

Digitalis fl. albo, in a Cloſe called Milbank, at Lorton Town End in Cumberland, copioſe.

Dryopteris alba Dodonei,

Ger. Emac.

Dryopt. nigra Dod.

Dryopt. Tragi.

} Theſe three I found
plentifully in a Place
called Trowgill, near
Clibburn, Weſtmerl.

Echium mar. P. Br. by Whithaven in Cumberland, and alſo over-againſt Bigger, in the Iſle of Waney, copioſe.

Elæagus Cordi, by the Rivulet between Shap and Anna Well, Weſtmerl.

Elatine fol. acum. Park.

Elatine fol. ſubrot. C. B.

} Both theſe I obſerved
on Stanhill, Weſt of
Henley Wood.

Equiſetum ſive hippuris lac. fol. manſu aren. Geſn. in Hell Kettles nigh Darlington, in Conzick Tarn Ditches, Weſtmer.

Eruca marina, Ger. *Cakile* ſc. at Roosbeck in Furneis, as alſo in the Iſle of Waney, Lancaſh.

Eruca Naſturtio cognat. tenuifolia, P. B. on Salisbury Plain.

Eruca Monenſis lacin. lutea, between Marybgrainge and the Iſle of Waney, Lancaſhire, in Sella Fields, Sea Banck, Cumberland. I purpoſe to obſerve this in the Iſle of Man, at Pentecoſt.

Eryngium vulg. J. B. on the Shore called Fryer-Goofe, near Newcastle upon Tyne.

Ferrum equinum Ger. *ſil. in ſumm.* ſc. C. B. on the Rocks by the Rivulet that runs from Anna Well towards Shap, Weſtmerl.

Filipendula Ger. J. B. on the Top of Conzick Scar, copioſe, Weſtmerl.

Fumaria alba latifolia Park. at Thornwhait, Foot of Longſledale, on the thatched Houſes in Kentmeer, Iſan Parles Cave Mouth, copioſe, Weſtmerl.

Fumaria major scandens in Great Strickland, Westmerl.

Fungus Phalloides, J. B. in Croft Short Close by Great Strickland.

Geranium batrachoides, fl. elegantè variegato in Old Deer, Westmerl. Park. by Thornwhait in Westmerl.

Ger. hæmatodes fl. elegantè variegato. Thousands hereof I found in the Isle of Waney, and have sent Roots to Edinburgh, York, London, Oxford, where they keep their Distinction.

Gladiolus lacustris Clusii, sc. Park. This I found in Winander Mear copiosè, and in Grayson Tarne, near Cockermouth, Cumberl.

Gladiolus palustris Cord. Ger. This I observed betwixt Teuxbery and Glocester in the Ditches.

Glaux Dioscor. Ger. close by Huntcliff Rock in Cleveland, Yorkshire.

Glaux vulg. Ad. Lob. on the Shore called Fryer-Goose, by Newcastle upon Tyne.

Gnaphalium Mont. album Ger. by the Force between Anna Well and Shap, on Sir Jo. Lowther's Pasture between Lowther and Hackthorpe, Westmerl.

Gramen triglochin, J. B. by the Rivulet between Shap and Anna Well, Westmerl.

Gramen sparteum capite bifido vel gemino, betwixt Hackthorpe and Lowther copiosè, Westmerl.

Hederula aquatica Ger. in Ditches between War-ton and Carnforth, Lancashire.

Helleborine minor alba, Park. in Sir John Lowther's Wood, directly against Askham Hall, Westmerl.

Helleb. flore atro rubente, Park. in the Lane by Abbot Wood Close, near Great Strickland, Westmerl.

Hieracium Macrocaulon hirsutum fol. rotundiore. This I found by Buckbarrow Well in Longsledale, and on the Rocks by the Rivulet between Shap and Anna Well, Westm. expect fair Samples, and my Description.

Hippofelinum, Ger. Emac. within and without the Walls of Scarborough Castle copiosè, Yorkshire.

Hypericum elegant. non ramosum fol. lato, J. B. on Conzick Skar by Kendale, on the Rocks by the Rivulet between Shap and Anna Well, Westmerl.

Hypericum pulchrum Tragi, J. B. in Trowgil near Clibburn, Westmerl.

Jacobæa latifol. palustris, at Great Strickland, in the watry Places by Clibburn Bridge, Westmerl. —

Juncus Acutus cum caudâ Leporinâ, J. B. being *Gramen junceum montanum subcæruleâ spicâ Mer.* 'Tis always *Spicâ simplici*: Its bluish Spikes appear soon after Christmas; after it turns white, Sheep are greedy after it: So 'tis called Moss-Crops about Clibburn, Water Sledale, and in all Places here, Westmerl.

Lactuca Agnina, Ger. about the Bank of the Roman Fort Maburg, nigh Round Table, Westmerland.

Ladanum Segetum, sc. J. B. on Lansmoor, near Great Strickland.

Lapathum pulchrum Bononiense, sc. J. B. betwixt the Inn and the Smithy at Sir John Lowther's new Town, Westmerl.

Lathyrus major latifolius, Ger. Emac. on the Rocks by the red Neese by Whithaven, cop. Cumberl.

Laureola, Ger. by Thornton, in the Bishoprick of Durham.

Lilium convallium, Ger. in Witherslack Park.

Lilium convallium angustifolium, on the Skar near Water-Fall Bridge, by Great Strickland, and in other Places, Westmerl.

Linum syl. fl. cæruleis Ger. Emac. at Crosby Ravensworth, and between Shap and Threaplands, Westmerl.

Lunaria ramosa, and *Lunaria crenata*, grow in Croft Short Close, by Great Strickland, *Lusus Naturæ*, Westmerl.

Marrubium Aquaticum, in the Moss by Hawkshead, Lancashire.

Melilotus vulgaris, Parkinson, by Langanby, Cumberland.

Mentastrum folio rugoso rotund. sc. J. B. by Marsh-grainge in Lancashire.

Millefolium aquaticum dictum Viola aquatica, J. B. in the River Kent, by Kendal, Westmerl.

Mil. palustre galeric. Ger. Emac. And *Mil. pal. gal. minus fl. minore*, in the Ditches by the Causey over the Moss, to the Fell-End, near Wither Slack.

Millegrana minima, Ger. on Clifton Moor and Clibburn Moor, Westmerl.

Morsus Diaboli Ger. flore albo, at Great Strickland, Westmerl.

Dendrobryon geniculatum Col. near Kendale, Westmerl.

Muscus cupressiformis Park. by Buckbarrow Well in Longsledale, Westmerl.

Muscus terrestris repens clavis singularibus, sc. J. R. towards the Foot of Longsledale, Westmerl.

Muscus terrestris polyspermos, by Buckbarrow Well, Westmerl.

Myrrhis syl. seminibus asperis, C. B. on Mud-walls at Blackwell, in the Bishoprick of Durham, on Mud-walls in Burlington, Yorkshire.

Numularia minor, sc. C. B. at the Foot of Longsledale, and near the Cloven-stone, on Great Strickland Moor, Westmerl. copiosè.

Oenanthe Cicutæ-facie, Lob. Park. about Kendale and Hiltondale, Westmerl. copiosè, where 'tis commonly called Dead-Tongue, in the Water-course of St. John's Well, by St. John's Chapel, in or near Scelsmoor, 3 Miles from Kendale.

Orchis palmata rubella cum longis calcaribus rubellis, J. B. in Troutbeck Holme by Great Strickland, West. where 'tis also found flore niveo, & fl. carneo.

Orchis sphegodes sive fucum referens, Park. in the Close on the West-side of Charlton Church in Kent, copiosè.

Orchis Myodes Ger. in the Lane or Way between *Holm-Park* House and the Crag; also in the Wood there pretty plentifully, *Westmerl.*

Ornithogalum luteum, C. B. in the Bushes at *Bander-Bridge End* by *Cotherston*, near *Rombald Church*, *Yorkshire*.

Ornithopodium minus, Ger. on *Clibburn Ling* near *Common Holm Bridge*, copiose, *Westmerl.* nigh *Raven-glass*, *Cumberland*.

Pedicularis Pratensis vulgaris fl. albo, at *Gunnerthwaite* in *Lanash*, at *Great Strickland*, *Westmerl.*

Pedicularis palustris elatior fl. albo, in the lower End of *Longsledale*, *Westmerl.*

Pentaphylloides fruct. by *Mickle-Force* in *Teasdale*, copiosif.

Perficaria siliquosa Ger. by the Cloth-Mill in *Satterthwait* Parish, *Lancashire*, and in many Places of *Westmerl.*

Phyllitis multifida, Ger. on the Rock by *Cartmal* Medicinal Well, *Lancashire*.

Plantago aquat. minor, Park. near the Clovenstone on *Great Strickland Moor*, *Westmerl.*

Plantago aquat. minor stellata, Ger. Emac. on *Clapham Heath* in *Surry*.

Polygonum mar. J. B. on the Shore between *Workinton* and *Whithaven*, *Cumberland*.

Populus Libyca, Ger. in *St. Herbert's Isle* in *Derwentwater*, *Cumberl.*

Primula pratensis inodora lutea, Ger. *veris caulifera*, sc. J. B. Great Cowslips. This in the North is commonly called *Lady Candlestick*.

Ptarmica fl. pleno, in the small *Holme* in *Winander Mear*, *Westmerl.*

Pyrola Brasiliiana Park. by *Gisborough* in *Cleveland*, *Yorkshire*. It grew in my Garden several Years; whether his *Major* or *Minor*, I was not satisfy'd.

Ranunculus flam. major Ger. *Lingua Plinii*, J. B. in the Water and Ditches of the Moss by *Hawkshead* in *Lancashire*.

Ranunculus

Ranunculus nemorosus dulcis secundus Tragi, Park. in *Dumetis copiosè*; particularly in *Sheriff Park* by *Great Strickland, Westmerl.*

Ranunculus palustr. rotundifolius, Ger. by *Robin-Hood Well*, nigh *Wentbridge, Yorkshire*, by *Middleton*, near *Lancaster*.

Reseda vulgaris, C. B. by *Clifford's Fort* at *Tinmouth Castle* in *Northumberland*, *copiosè*.

Rhamnus Catharticus, J. B. in the *Rocks and Hedges* by *Great Strickland, Westmerl. copiosè*.

Rhamnus secundus Clusii Ger. Emac. on the *Sea Bank*, between *Whitby* and *Lyth, Yorkshire, copiosè*.

Ros solis fol. oblongo, C. B. } Both these in *Mosey Mire* in *Witherslack, Westmerl.*
Ros solis fol. rotundo, Ger. }

Rosmarinum syl. minus nostras, Park. in *Brigsteer Mofs*, not far from *Kendale, Westmer.* in *Middleton Mofs* by *Lancaster*.

Rubia cynanchica, J. B. on *Beltbarrow* in *Witherslack Park*, and on the *Top of Conzick Scar*, near *Kendale, copiosè, Westmerl.*

Ruscus, J. B. on *Westwood Common*, nigh *Sydenham* in *Kent*, not scarce.

Saponaria fl. pleno, at *Carnforth* in *Lancashire*.

Saxifraga palustris Anglica, Park. in *Troutbeck Holme*, by *Great Strickland, Westmerl.*

Scabiosa minor prat. fl. carneo, Park. in the *Closes* between *Melkinthorp* and *Water-fall Bridge, Westm.*

Scrophularia major, Ger. by *Water-fall Bridge*, and in many other *Places* in *Westmerland*, where the common People call it *Hastie Roger*.

Sedum Alpinum trifido folio, C. B. by *Maltham Cove, Yorkshire*, among the *Rocks* South of *Sir John Lowther's, Westmerl.*

Senecio hirsutus viscidus major odoratus, J. B. about *Sunderland*, nigh *Lancaster*.

Serratula fl. albo, in a *Close* by *Hampsted Heath*, and on *Sowfield* by *Great Strickland, in Westmerl.*

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Sium minimum, J. R. near Cloven-stone, in the Sike on Great Strickland Moor, in a watery Place by the Roman Fort, called Maburg, Westmerl.

Soldanella marina Ger. in the Isle of Waney, Lancashire.

Ornus five Frax. sylvestris Park. in the Scars nigh Water-fall Bridge, in the North. 'Tis known by the Name of Rawn, or Rown-Tree, or Rone-Tree, Westmerl.

Sorbus Torminalis Ger. in Levens Park. near the Bridge, Westmerl.

Stellaria Aquatica Park. in the Ditches of Middleton Moss, Lancashire. Here I saw it in Flower.

Thalictrum majus Ger. by Cartmal's old Well, near the Medicinal Well, Lancashire.

Thalictrum minus Ger. in the Isle of Waney, copiosè, Lancashire.

Tormentilla fl. pleno, at Temple Sourby in Westmerl.

Filix marina Anglica Park. under a shadowy Sea Rock, by Middleton near Lancaster.

Pneumonantbe, Ger. on Red, or Rud Heath, in Cheshire, copiosè. Also near Clapham in Yorkshire.

Trachelium minus fl. albo, in Troutbeck Holme by Great Strickland, Westmerl.

Trifolium album umbellâ fil. Mer. betwixt Virginy-House and Nag-head Inn, in the Way to Hackney, London.

Trifol. pumilum supinum flos. longis albis, P. B. *Trifol. subterraneum tricocon* Mor. on Black-Heath in Kent, It grew in my Garden.

Trepodium, sc. Isle of Waney, Lancashire.

Turritis, Ger. at Clibburn, Westmerl.

Vaccinia nigra, Ger.

Vac. nigr. fruc. maj. Park.

Vaccinia rubra, Ger.

Vac. palustria, Ger.

} All grow in the Forest of Whinfield, Westmerl.

Verbena vulg. J. B. at Cockermouth in Cumberland, plentiful.

Viola

Mr. Lawson to Mr. Ray. 223

Viola mont. lutea grandiflora, C. B. by Elden Hole in Darbyshire, Malham Cove in Yorks. on Stanmoor in Westmer. abundantly.

Virga Aurea, Ger. in Clibburn Field, Westmerl. abundantly.

Umbilicus Ven. Ger. at Oxford, and about Bristol, copiosè.

As for *Orchis palmata pal. mac.* Park. and his *Orchis pal. pal. dracontias*, in my Judgment, you have truly referred them. I have consulted *Park.* and *Ger. Emac.* and see no Reason to distinguish them. Pray consult *Park.* and *Lobel.* *Lobel* I have not. *Park.* I suppose distinguishes them upon his Authority. I purpose to mind them in this following Season.

Mr. Lhwyd to Mr. Ray.

Honoured S I R,

Oxford, Feb. 25. 16⁸⁹.

THE same Varieties of *Entrochi*, with those you sent me, are found in *Staffordshire*; but I had none exactly like them: For tho' I pick'd up some Variety of them in *Wales*, yet they all differ from these in *Texture*, *Consistence* and *Colour*. About *Oxford* we have considerable Variety of form'd Stones, more than *Dr. Plot* has mention'd in his *History*: But no *Entrochi* were ever found in this County that I have heard of. If any of these form'd Stones may be acceptable to you, I can send you a Parcel when ever you please to command it.

Dr. Morison's first Tome, which with the second already printed, contains all the Herbaceous Kind, is ready for the Press. Pray excuse this hasty Scribble, and repute me, &c.

Mr.

Mr. Lhwyd to Mr. Ray.

Honoured SIR,

Oxford, April 14. 1690.

DR. Lister acquaints me that Mr. Charleton has lately receiv'd a *Land-Snail* from *Suranam*, not bigger than a Hen's Egg, which yet lays Eggs as big as those of a Sparrow; and the *Snails* that are hatch'd of them are, he says, twice as large as the Eggs.

Sir, I thank you for your Pattern of the *Musculus Denticulatus major*. One Mr. Richardson, a Gentleman of *Yorkshire*, (a Person very curious about Plants, and the other Parts of Natural History, and that has spent about 6 or 7 Years with Dr. Herman in that Study) told me he was somewhat secure that Plant grew in *Yorkshire*, under the Heaths, and promis'd to send me Patterns of it this Summer.

I only expect your Commands for some *figured Stones*: Those that this Countrey affords are chiefly in Imitation of *Shells*. We have none that resemble *Fish*, or any other Animals besides, nor that have the Resemblance of any *Plants*. *Cornu Hammonis*, *Asteriscus*, *Asteria* S. *Astroites*, and *Belemnites* of divers Sorts, we have plentifully, as also some others that I cannot compare to any natural Bodies that I have any Notion of. One Quarry within 2 Miles of *Oxford* I have search'd at least 40 times, and sometimes had 5 or 6 with me; yet last *Saturday* I discover'd there 3 Varieties of *Glossopetræ*, tho' none had ever been observ'd in this Part of *England* before for what I can learn. One of them is a *Tricuspis*, such as Dr. Lister's in one of the *Phil. Transact.*

Mr.

Mr. Ray to Dr. Robinson.

S I R,

Concerning the *Catalogue of local Words*, I shall add nothing till I hear farther from you, save that a Friend, whom casually I met withal last Week, asked me concerning that Catalogue, and told me that he had made a Collection of a few Words proper to this County, which he was willing to communicate, in case the Book came to a second Edition.

Upon this Occasion I cannot but take Notice, that as if Divine Providence govern'd even such small Matters, when I have been about to publish, or in publishing a Work, there have been casually offered to me, without my own or Friends Procurement, at that very time, some Assistances or Contributions by mere Strangers, and such as knew nothing of the present Publication, or at least such as I made no Address to, nor expected any thing from. Mr. *Lloyd* lately wrote me word of a strange Snail Mr. *Charleton* had receiv'd from *Surinam*, which was not above the Bigness of a Pullets Egg, yet laid an Egg as big as a Sparrow, and that the young one hatch'd of it was twice as big as the Egg; of which Particulars I desire Confirmation from you.

Black Notley, May 16. —90.

Dr. Robinson to Mr. Ray.

S I R,

London, May 17. —90.

MR. *Charleton* has such a *Snail Shell*, as you mention, with Eggs and young ones, which are the Wonder of our Philosophers here; but I being

G g

naturally

naturally too jealous, do almost suspect (tho' I durst never declare my Suspicion, the thing appearing clear to every body besides my self) that the *Eggs* and *young ones* have been severally, and very artificially added to the Snail, tho' indeed the *Snails* are *oviparous*, and peradventure, perfect shell'd Animals may be observ'd in the Eggs themselves; so that I may be under an unreasonable Doubt.

*Dr. Plukenet's Observations on Mr. Ray's
Synopsis Stirp. Britan.*

SIR,

June 3. 1690.

Page 57. **T**HE laborious *Parkinson* was indeed mistaken when he confounded the *Chamæ. vulg.* that grows among Corn, with the *Nobile* or *Roman Kind*; and we are not a little obliged to your learned and peircing Observation for the Discovery of it: But I cannot readily submit that the *Chamæ. flor. pl.* (which we have so common in Gardens, or the naked Sort) should either of them be Varieties of this *Amarum Kind*, since they are both very fragrant, and creëping upon the Ground, and nothing different, but in those very Accidents, of flowering from that which grows trailing on our Commons; which, however erroneously styl'd *Vulgar*, yet in reality is the *Roman*, or *Noble* Sort of *Chamæ*. But that which ordinarily goes under the Name of *Cotula fœtida fl. plen.* which I once found in some Plenty on the high Road from *London* to *Barnet*, about half a Mile short of the Town, is both upright in its Stalk, and of no Scent at all. And this I dare pronounce to be the *Double* of the *Chamæ. arvor. vulg.* which I take also to be different

different from the *Cotula foetida* Dod. or *Chamæm. inodorum* C. B. P. Of which Sort I never yet beheld any with a double Flower. I must needs own, that Dr. Moris. in *Præclud.* 249. relating there how frequently this *Cotul. inod. sem. nigr.* did occur to him upon the Coasts of *Bretagne* in *France*, assigns our double flowering to a Variety of this; assuring it also to produce Seed of a like Hue. I will not question the Doctor's seeing the Seed, (tho' double flowering Plants seldom bear any) because he seems to be very positive in it: Nor indeed was I ever so curious to observe it, not having seen a growing Plant for above these 20 Years, and so am ignorant of its Colour; but the Mein and Air, the total Habit of this Multiplex Kind, of which I still retain a firm Idea in my Mind; the lower Stature of it tho' upright, the brisk and vivid Colour of its Leaves, the fewer Branchings of its Stalk, the lesser Compass of its double Flowers, and shorter Lengths of its fine cut Leaves; in all which the *Chamæm. vulg.* differs from the *Cotula inodora*, which bespeak it to appertain rather to the former. Of which in my Catalogue I have made it a more immediate Variety.

Page 61. There is a *Limonium minus* said to grow with us in the North of *England*, and which I have observ'd in Gardens; perhaps the same Sort that *Parkinson* asserts *Lobel* to have found about *Colchester*. The most Peculiarity that I could observe, beside that of its being smaller than our common, was a foliaceous Wideness on the Pedicle of each Leaf, even to its Insertion to the Root or Stalk; whereas our common has a slender, round and nervous Pedicle, for a considerable Distance towards the Leaf.

Page 64. Altho' you seem to suspect the *Archangel. Dod. Clus.* to be the same growing on mountainous Places with the common *Angel. Sylv.* in our Meadows, and so difference of Place only to make the Diversity: I assure my self they are specifically diverse; and the *Scandiaca* has this Peculiar, that it

produces its Umbels not only a Top, but also on the Side of the Stalk, 2 or 3 *ex alis foliorum*, and sometimes one or two along the upper Stalks without any Leaf at all; and I have seen it above 7 Foot high.

Page 247. Among the *Emendanda* I find a Query about the *Cnicus Spinofior* of the *Parisian Catalogue*, which I take to be no other than that perennial Sort you set down in your incomparable *Cat. Angl.* and observ'd it to grow plentifully at lesser Distances from the Sea, both in *Italy, Sicily*, and the more Southern Tracks of *France*; whose Resemblance, tho' it come well nigh that Figure in *Clus.* under the Title of *Carlina Sylv.* which I esteem no more than our spontaneous annual Sort, yet certainly it seems more nearly to respond the *Heracantha* Tab. Ic. 697. both as to its Figuration and Manner of growing, putting forth its Flowers in the Way of an Umbel. And tho' this be made use of as a Synonyme to express the foregoing common Kind, as we find it even in *C. Baub.* himself, yet I am inclin'd to believe this very *Heracantha* is nothing different from the *Cnicus* of the *Parisians*, and in all likelihood the same with the *Cnicus Sylv. Spinofior Polycaph.* of the same *C. Baub.* Not therefore to be accepted for our common Kind, nor indeed the *Acarna S. Acorna altera Apula Column.* which latter, both from the *Fabian* Description of it, and Synonyme of *C. Baub.* which seems by him particularly adapted from the Parvity of its Flowers and Heads, must be quite another thing. But what this is I cannot determine, as never having seen the Plant, and therefore do submit it to your most excellent and discrete Judgment.

The *Polygala repens nivea* C. B. P. *repens nuperor.* Lob. I do readily grant is a *Polygonum*, but extremely differing from the *Polyg. Serpylli folio verticillat.* Cat. Angl. *parvum fl. albo verticillat.* J. B. which comes under a much nearer Resemblance to the *Polyg. muscosum* P. Bocc. tho' it be very different from this too,

as by collating the Plants themselves, I having them by me, you will easily perceive.

That pretty *Polygonum* Mr. Newton found in Cornwall, my self upon the Severn Shore, cannot be the — *Pusillo vermiculato Serpylli folio* J. B. *Serpylli folio* Lob. Park. if at least the Figure of it among Authors does any way agree with the thing, since the Leaves of this are round and shining, but nothing of a *Stonecrop* Shape: And therefore, as you have given it the Honour of a Place in the Appendix of your learned Synopsis, you may find I have given it a different Name, viz. *Polygonum maritimum longius radicatum nostras Serpylli folio circinato crasso-nitente*; and perhaps 'tis the same with the *Polygon. minus lentifolium* C. B. P. as I have there set down my Suspicion.

The *Gnaphalium Maritimum* you have rang'd (without any Remark) among the pappescent of that Kind, when *Breynius* in *Prodr.* 2. assures it hath solid Seed.

Page 54. The *Carduus Leucographus hirsutus Capitulo minori* Morisf. I take to be very different from the *Card. Mariæ hirs. maculatus* growing so copiously about *Clerkenwel*, whose Head is little inferior for Bulk to the more common with milky Veins.

Page 120. *Quer.* Whether the *Anagallis Aquatic. major folio oblongo* C. B. P. be not clearly omitted. As for the *Aquatica major foliis subrotundis*, perhaps it may be only a Luxuriance of the *minor* under the same Denomination.

Page 168. *Quer.* Whether the *Leucoium luteum* upon Walls be not a different Plant from the *Leuc. vulgar. fl. simpl.* growing in Gardens: It seems to me to be much more woody, with larger Flowers; the Leaves glaucous, and extremely rigid or stiff, Qualities not to be observed in the Garden Kind.

Page 133. I ever took the *Trifol. pumilum supin. flosc. long. alb.* *Phytol. Brit.* to be very applicable to the *Trif. siliquis Ornithopodii nostras*; and perhaps the Author of its Name meant no other thing by it. The
Flowers

230 *Dr. Plukenett's Observations,*

Flowers are long, slender, and pip'd; they are of a most immaculate white, (tho' your Description seems to put them to the Blush) and often with three on a Stalk; which Number of short and curv'd Pods succeeding, does make out a pretty Resemblance of a Bird's Claw, and I am fully persuaded the *Trifolium parvum album Monspeliac. cum paucis floribus*, J. B. is no other than this *Birds-Foot Trefoil*, which in my Catalogue I have made a Synonymie for it. As for the *Trif. subterr. tricocc.* whereunto you incline to apply the Phytologists Title, 'tis true it has indeed the same Sort of white fistulous Flowers; but withal, it has such a Singularity in the Mode of growing, as thrusting the Stalks of its Flowers, even while it is in Flower, into the Bosom of the Earth, that I cannot but think this very Peculiarity could not possibly have escaped the Observation of its first Explorers, who could not be so deficient in their way of imposing Names, as to neglect such a remarkable Note, so signal a Characteristick in the Composition of its Title, as alone might serve to distinguish it from all the *Terræ filii* and *Trefoils* in the World. After this Manner it was that the famous Dr. *Magnol* accommodated his Name for it; so did Dr. *Morison* his, who indeed pretended to be the first Discoverer of it, or at least assign'd it to his Princely Patron, whose Badge (*Gastonium*) was annex'd unto its other Titles in Memory of its first Invention, tho' I find it (yet still by Names expressive of this Peculiar) in Authors before him; as in *Vallot*, *Joncquet*, and other Catalogue Writers, before that of the Garden of *Blois* by *Morison* had any Being in the World: So that I only hence infer, that had the Authors of the *Phyt. Brit.* or the most learned *J. Bauhine* (but he saw not the growing Plant) in their Denominations intended the Subterranean Trefoil, they would not have contented themselves with lodging their discriminating Character upon the Flowers alone, (that are inter-common
with

with others of the same Genus) but would certainly have taken along with them this wonderful Property, which while the Plant was flowering could hardly have evaded their Notice: And therefore I presume they understood by those stated Names no other than the *Trif. Ornithopod. siliq.* which they might observe in Flower, not heeding the Pods, or perhaps finding the Plant before it was podded, they were content to transmit such a Diversity in its Name, as was derivative only from its Flowers. Both these pretty *Trefoils* grew in great Abundance in *Tutbill-Fields* by *Westminster*.

Page 145. The *Alfine Tetrapetalos Caryophylloides quibusdam Holost. minim.* D. Rap. that grows frequently about *London* in Upland Pastures, is very different in my Opinion from the *Alfine montan. capillac. folio* C.B.P. which indeed is a Foreigner to us, but has a Leaf as fine as a Hair, and four white Leaves to the Flower, as the Name imports, and is a pretty upright Plant; of about a small Span in Stature, and not much unlike the *Alfin. tenuif. muscosa ejusd.* C. Bauh.

The *Auricula muris pulchro flore* J. B. omitted in the Synopsis, but inserted among the *Supplenda*, might perhaps have been supply'd by the *Alfine Myosotis lanuginosa Alpina grandiflora* S. *Auricula muris villosa flore amplo membranaceo* D. Lwyd, as being the same, or a Variety of it.

Page 150. As for the *Sedum parvum acre flore luteo*, it is multifiliquous, or multicornous in its Capsule, divided into 5 Points; and when ripe, makes a pretty Resemblance of a Star; and therefore, in my Opinion, ought not to be disjoin'd from the *Sedum's* properly so call'd, p. 98. Under this Banner does the *Sedum minimum acre* march; and if I mistake not, the *Minus teretifol. album*; but I have not yet thoroughly examined it, and therefore am not positive therein: Nor can I say, without a Peradventure, the like of the *Alpinum Ericoides cæruleum*, C. B. P. Indeed

deed your *Sedum min. Alpinum luteum nostras* is to the best of my Memory only bicornous, and is rightly dispos'd with the *Sedum Alp. trifid. folio*, C. B. P. which in my Catalogue goes under the Name of *Sanicula aizoides tridactylites*; and for the better distinguishing it from the *Sedums*, I have made bold (and I hope not without your good Leave) to alter your Name, and prefix another to that elegant Plant of your own happy Discovery, which with all its Synonyma, I must submit to your Approbation, viz. *Sanicula aizod. Alp. fl. majuscul. lut. punctis croceis guttato. Sedum minus Alpinum luteum nostras*, D. Raii. *Sedum parvum montanum lut. J. B. Sedum Alpinum flore pallido*, C. B. P. Park. and fortè *Sedum montanum Coris cæruleæ fol. Cat. H. R. P.*

Among other of our vegetable *English* Rarities, I should think the *Sedum minus lato & crasso caule* Cat. H. R. P. *Portlandicum Belgarum* might have deserv'd some Place in your well instructed Synopsis. I never was upon the Island my self, but I have had it from very worthy Persons that have seen it grow there. It is a vermiculate Kind, but I could not learn that it ever flowered; perhaps the Grossness of its Fascial Stalk absorbs the Nourishment, that might otherwise have contributed to the Production of its Flowers.

The *Sedum Alpinum trifid. folio* C. B. P. must be allowed the same with the *Sedis affinis trifulca Alpin. fl. albo*, J. B. and yet I have seen it in a dry Season notably correspond both the Description and Figure of the *Sedum Alpin. hispidum ferè spinosum* of the same Author, and perhaps the same thing.

Page 151. The *Cotyledon hirsuta* Ph. Br. tho' to my own Knowledge it be very different from the *Sedum minus* Clus. Yet methinks it bears a very favourable Resemblance to the *Saniculæ Alpineæ aliquatenus affinis*, J. B.

I must needs acknowledge that I am not a little entangled in my Thoughts about the *Juncus parvus cum pericarpis*

pericarpis rotundis, J. B. which tho' you are pleas'd to make the same with the *Gram. junc. marit.* Lob. I cannot easily obtain with my self a Compliance herein, but do rather accept it as the *Juncus acutus Cambro-Britannic.* Park. and which I take to be a true and genuine *Rush*, as you most truly have observ'd. But unto this you are pleas'd to apply the *Junc. Cambrobr.* Park. (*b. e.*) *Gr. junc. maritim.* Lob. whose Icon of it (and indeed so do those of all other Authors) agrees exactly with our *Moss-Rush*, the Capsules whereof are somewhat elongated and pinch'd in towards the Top, resembling more a Cone than a Globe, the Capsules of the former being more accurately round, according as its Name imports.

Page 213. I must here beg Leave to excuse the celebrated Dr. *Herman*, who in *Cat. Hort. Acad. Ludg.* with good Reason separates the *Abies conis sursum spectantibus*. S. Mas, C. B. P. *Taxifoliis*, from the *Abies alba* S. Fœm. ejusd. C. B. P. And indeed this Male-Kind does in nothing differ (as I could observe from the short Specimen (and 'twas all that he had) I receiv'd from that ingenious and worthy Gentleman Dr. *Tancr. Robinson*, who gather'd it in some noted Garden there, and brought it over into *England*, when with the present Marchioness of *Winchester* he last came out of *Holland*;) I say, from what I could observe, it does nothing differ from the Female, but in the Colour of its pectinated Leaves, which in our Pattern are green on both Sides; in this, of a Silver and gaudy Hue underneath: And perhaps from this lovely Gaiety of its Silver Colour, it might at first challenge to it self the Annex of Female, since Men are generally apt to appropriate the most amiably and lovely, and indeed the most excellent of every Kind, to the more elegant Sex, as we see the more masculine Arts and Sciences are Feminine in their Names, and by an universal Suffrage submitted to the Dominion of the Muses.

Casting my Eye upon your most curious *Index* at the latter End, which is indeed of necessary Use both as to the Virtues of those Plants contained in the Synopsis, as also in respect of those References you make from the less to their more proper Denominations, I found in your Account of the *Cannabis sativ.* the receiv'd Opinion of an untoward Faculty it has of emasculating Mankind, and making impotent by extinguishing the fluid Principles of Generation, and which in some degree hath stagger'd your Resolution what to determine about the *Bangüe Indorum*. This from the Testimony of *Olcarius Acoſta*, and others, being of frequent Use, both among *Persians* and *Indians*, to extimulate and incite to *Venery*; and therefore very unlikely to be of the *Cannabine* Order. I confess I cannot determine how far it may conduce to this Purpose, or the other to the contrary Effect: But so much I know of the *Bangüe*, (the Seed whereof I have by me, and is very little differing from that of our *Hemp*) that it will certainly cause a *Dementia*, or *frantick and ludicrous Sort of Madness*, which runs the Body into all the idle Gesticulations and Postures of the most lascivious, when in the mean time they are only the Effects of present Distemper, and not any lustful Pruritions: And that Nature is in Distress, and under Distemper, till the Force and Powers of the Seed be dissipated, and vanquish'd, will appear by this, that if you over dose your Patient, it will certainly kill. I have known where upon too liberal a Dose the Effects have continu'd for almost a Week, and had like to have put the poor Soul to have sought for a *Bethlem* in another World. And why may not the *Cannabis* prove an Incentive in the same unlucky Sense, especially if that be true, as Authors have alledged, that its Seed, if freely taken, will induce an *ἀφροσύνη*; and as *Herodotus* attests, a Fumigation of the Seed being cast upon hot Coals, is said to affect the *Scythians* with Raving, and a Sort of *Phrenzy*, that

was

was attended with frightful Ejulations and Howlings ; so that they well enough agree in this Particular. And it cannot surely but be allow'd on all Hands, that this *Indian Bangüe* is a true and genuine *Hemp*, tho' in the mean time I must pronounce it specifically distinct from our *European* Sort. I confess I was perfectly surpriz'd to find Dr. *Herman* in his Academick Catalogue so peremptorily assert it among the Race of *Altheas*, and to promise the World an entire History of it under that Head in his desired *Musæum Leylanicum*, till calling to mind a Mistake that had crept into the Garden of *Chelfea*, where some time before the Catalogue came out, the *Sabdariffa Clus.* (which is no other than an *Indian Alcea*) was with mighty Ostentation expos'd to View for the *Bangüe Indorum*. I presently bethought, that as that Demonstrator had impos'd upon Dr. *Lisler* and other worthy Gentlemen here at home, so holding at that time a Correspondence in *Holland*, he might in all Probability have transmitt'd the Occasion for Dr. *Herman's* most palpable Hallucination abroad.

Mr. Lhwyd to Mr. Ray.

Honoured S I R,

Oxford, July 1. 1690.

THE form'd Stones were very acceptable. The *Oculi Serpentum* are indeed of the same Kind with those they call *Toad-Stones*. The *Cats-heads* seem to me to be Arches or Joints of some *Cornu Hammonis*. *Baculi S. Pauli* are of the same Substance with those Stones that resemble the Bristles of some *American Echini*, which (as I mention'd in my last) Dr. *Plot* has call'd *Lapides Judaici*; nor is the Doctor much mistaken therein, for the real *Lapides Judaici* seem to be nothing else but over-grown

H h 2

Stones

Stones of this Kind, as your large *Glossopetra* is amongst the rest of that Sort; whereof I have seen one found in *Shepey* much larger than that elegant one you sent me. When I say over-grown, I mean a large Sort, or Variety, much exceeding those of its Family; which puts me in mind of a current Report, how that in the County of *Antrim* in *Ireland* there are divers large Pillars of *Star-stones* able to support a Church. How your *Bastions* of *St. Paul* differ from our *Bristlestones*, you'll best judge from some I shall send you. The *Vertebræ* seem to be so indeed, and to have undergone but a small Alteration. Those inscrib'd *Dentes Serpentum*, and *Ova*, I can say nothing to.

A Synopsis Method. of the Animals and Fossils of England would doubtless prove very instrumental to the Advancement of Natural History: And tho' a compleat Enumeration of those Things would require much Time, Labour, Expence, and Travail; yet I doubt not but such a Catalogue as you could give us would be very grateful to the Publick, and prove a Direction to several others to make farther Observations of that Kind, as well as your Catalogue of Plants has done. I question not but you may give us a great deal of Information in the Catalogue of *Insects*, as well as you have done already in the *Histories of Birds* and *Fish*. I shall be very forward to give in my Contribution, which will be some Observations of *Form'd Stones*, and of the *Exanguia Marina*. *Dr. Plot* will be likewise as ready.

We have perform'd our Visit to *Mr. Cole*, and receiv'd abundant Satisfaction in our Journey. He receiv'd us (tho' all unknown to him) very friendly, and spent 6 Hours in shewing us his Collection, without any Interruption, or the least Sign of being weary: It consists altogether of natural Things, and seem'd to us a very extraordinary Collection for one Person (and who perhaps had not the Advantage of a li-

a liberal Education to invite him to such Studies) to be able to amass together.

We observ'd a *Virginia Animal* of the *Cat-Kind* 7 Foot and a half long, and another of the Colour and Bigness of our *Wild Cats*, which he told us was the common *House-Cat* of *Virginia*: Also a *Skunk*, which he render'd *Putorius Virginianus*. This he told us will stink several Miles, and sometimes so infect the Air, as to cause a Pestilence. He shew'd us the *Horn* of a *Narhual* curiously wreath'd, and about 5 Foot long. A *Danish Gentleman* told me he had seen a *Narhual* that had been taken by some *Hamburghers* at *Groneland An. 1684*, having two very long Horns; and that he suspected they generally have so, and that the *Unicorns* of them are but Monsters. We also observ'd some of the *Corneæ Laminæ* of a *Whale* about 3 Foot long, and one broad, of a black Colour. We have some at our *Museum* of a whitish Colour, and about 9 Inches long: Also the *Blade* of a *Sword-fish*, caught about *Swanzy* in *Glamorganshire*. He has several curious figur'd Stones and Shells, found in the West of *England* and in *South Wales*; very elegant Trees of the *Abrotanoides Planta Saxea Clusii*, with considerable Variety of other *Pori*, *Coralls*, *Horny Sea Plants*, &c. I admired a Sort of *Cornu Ammonis* found somewhere in *Somersetshire*, resembling a *Nautilus*; but having two Prominencies, each Side of the Aperture about as thick and taper as the End of a Walking-Staff to be screw'd in and out. Another *Cornu* of a Rainbow Colour, about 6 Inches Diameter, and as thin as a Shilling, composed of a Sort of *Selenitis*, or *Talk*. The Resemblance of several exotick Plants (as it should seem to me) in a Kind of *Cole-slat*, found somewhere near *Bristow*: They seem'd to be of several *Capillaries*, and one particularly like the *Capillus Ven. verus*; the Signatures of the Leaves as curiously vein'd as the real Plants have. I have room to add no more at present.

Mr.

Mr. Lhwyd to Mr. Ray.

Honoured S I R,

CONsidering your *Local Words* since I read your Letter, I find some amongst the *North Countrey Words* to bear Affinity with the *Welsh*, both in Sound and Signification, which possibly may be some Remains of the *British* Tongue continued still in the Mountainous Parts of the North. Of these (if you please) I shall hereafter send you a Catalogue; but in the mean time I must confess, that altho' they may agree in Sound and Sense, it will yet be difficult to distinguish whether they have been formerly borrowed from the *Britains*, or whether they are only an Argument that the ancient *British* Language had much Affinity with those of *Germany*, *Denmark*, &c. I omit the Supposition of the *Welsh* borrowing them from the *English*, in regard I find them not, (at least but very few of them) used by the Borderers of both Nations; and the *Britains* might leave them in *Westmorland*, *Cumberland*, &c. having heretofore lived there: But the *English* of those Parts could communicate nothing of their Language to the *Welsh*, in regard they have never liv'd in *Wales*, nor have border'd on them. Moreover, some of these Words are in the *Armorican Lexicon*, and the *Britains* that went to *Armorica* left this Countrey before the *Saxons* came in.

The *Pectinites Amphiotis latiusculè sulcatus*, and the *Echinites rotularis minor angusticlavius*, (with some others) are commonly found in Beds of Sand, which lie under the Vein of Stone at the Bottom of the Pits, tho' sometimes I have found the former in the Stones by breaking them; but those usually of a different Colour

Colour from the Sand Shells. Whether they were ever the *Tegumenta* of Animals, or are only primary Productions of Nature in Imitation of them, I am constrain'd to leave in *Medio*, and to confess I find in my self no sufficient Ability or Confidence to maintain either Opinion, tho' I incline much to the latter. However it be, it seems an extraordinary delightful Subject, and worthy the Enquiry of the most judicious Philosophers. On the one hand it seems strange if these things are not *Shells petrified*, whence it proceeds that we find such great Variety of them, so very like Shells in Shape and Magnitude, and some of them in Colour, Weight and Consistence; and not only Resemblances of Sea Shells should be found, but also of the *Bones* and *Teeth* of divers *Sea-Fish*, and that we only find the Resemblances of such Bodies as are in their own Nature of a Stone-like Substance. On the other hand it seems as remarkable, that we seldom or never find any Resemblance of *Horns*, *Teeth*, or *Bones* of *Land Animals*, or of *Birds*, which might be apt to petrify, if we respect their Consistence; insomuch that I suspect few form'd Stones are found, (at leastwise in *England*) except in some extraordinary petrifying Earth, but what a skilful Naturalist may (and that perhaps deservedly) assimilate to some *marine Bodies*; but yet when we confer them with those Bodies they seem most to resemble, they appear generally but as Mock-Shells and Counterfeit-Teeth, differing from them little less than the Works of Art do from those of Nature, which we endeavour to imitate; as if the Earth in these Productions (to speak vulgarly) should only ape the Sea. To find out the Truth of this Question, nothing would conduce more than a very copious Collection of *Shells*, of the *Skeletons* of *Fish*, of *Corals*, *Pori*, &c. and of these supposed Petrifications.

The *Figures of Plants in the Cole-slat* I have formerly mention'd to you, is clearly a different thing
from

from the *Picta Imboschata* of *Imperatus*. Indeed I have hitherto seen imperfect Pieces of it; but whereas the *Picta Imboschata* (of which Kind of Figures we have also some Variety in *England* and *Wales*) represents only rude Branches imitating rather some *Coralline* or *Sea-moss* than *Trees*; the *Cole-slat* exhibits whole Branches with Leaves and Distinction of the Veins and Texture of them. I have a small Piece, which seems to resemble a Branch of the *Filix Fœm.* very much; but the Specimen is very imperfect.

Mr. Bobart tells me the *Gymnocrithon* is the very same with the *London Triticum Spica bordei*. The *Alpine myos. lan. Alpina grandiflora* I do not question at present to be a distinct Plant from the *Aur. muris pulchro fl. albo*, J. B. which is very common in these Parts, but no where in North *Wales* (supposing this no Mistake) that ever I could find. The Plant I mean I never saw but at the highest Part of all *Snowdon*: It's very woolly, but more especially before it comes to flower, which is extraordinary membranaceous, or thin; the *Calix* very long, crooked and transparent, and divided at the Top with many Notches; the whole Plant every way bigger than the *Auricula muris*. Since I sent you the Collection of Stones, I have discovered several new ones, whereof you may hereafter expect some farther Account from, &c.

Oxford, Nov. 25. --90.

Mr. Ray to Dr. Robinson.

S I R,

Black Notley, Dec. 15. --90.

THE *Essay* you propound concerning the ancient and modern Learning were not difficult to make; but I think you are better qualified for such

an Undertaking than I, and therefore shall refer it to you. In Summe the Ancients excel the Moderns in nothing but Acuteness of Wit and Elegancy of Language in all their Writings, in their *Poetry* and *Oratory*. As for *Painting* and *Sculpture*, and *Musick* and *Architecture*, some of the Moderns I think do equal, if not excel, the best of them, not in the Theory only, but also in the Practice of those Arts: Neither do we give place to them in *Politicks* or *Morality*; but in *Natural History* and *Experimental Philosophy* we far transcend them. In the purely *Mathematical* Sciences abstracted from Matter, as *Geometry* and *Arithmetick*, we may vie with them; as also in *History*: But in *Astronomy*, *Geography* and *Chronology*, we excel them much. No wonder they should outstrip us in those Arts which are conversant in polishing and adorning their Language, because they bestowed all their Time and Pains in cultivating of them, and had but one, and that their *Native Tongue*, to mind. But those Arts are by wise Men censured as far inferior to the Study of Things, Words being but the Pictures of Things; and to be wholly occupied about them, is to fall in love with a Picture, and neglect the Life: And *Oratory*, which is the best of these Arts, is but a kind of voluptuary one, like *Cookery*, which sophisticates Meats, and cheats the Palate, spoiling wholesome Viands, and helping unwholesome.

Mr. Ray to Dr. Robinson.

SIR,

March 10. --90.

YOUR last Letter of March 3^d expresses such Excess of Kindness, as one that did not well know you to be aliene from all Flattery or Dissimulation, would hardly think you wrote your own
 I i Sense,

Sense, especially seeing no Merit of the Object could induce you. I cannot but thank you for your great, tho' undeserved (that I say not ill-placed) Affection, which must needs enkindle an answerable Flame of reciprocal Love in the Breast of any Man that hath the least Sense of Gratitude, or Spark of Good Nature in him.

Of *English Serpents*, I never knew, nor heard of above 3 Kinds; and tho' one cannot be sure of a Negative, yet I verily believe there are no more: Those are, 1. *Natrix Torquata*, or the *Snake*, so called because it hath a pale yellow Spot, or Streak, on each Side its Neck, tho' not encompassing it.

2. *Vipera*, or the *Adder*. I am well assured that *Viper* and *Adder* are two Names of the same Species, having taken exact Notice of the Viper beyond Sea, and our Adder at home. The Differences between the *Adder* and the *Snake* are, that the former is much shorter for its Bigness, especially his Tail below the Vent; that he is marked on the Back with black Lines or Spots, which the Snake wants; that his Belly is blackish, and of one Colour; whereas the Snake's is particoloured, of a pale yellow and blue. That the Adder never grows to the Bigness that I have seen some Snakes attain to: And lastly, that the Adder is viviparous, as I my self can testify, having taken seven young ones out of the Belly of a Female, come to their full Perfection, as big almost as some Women's Little Finger.

3. *Cæcilia*, the *Blind-worm*, or *Slow-worm*, which again are two Names of the same Sort of Animal. It is much less than the Adder, and straked with blackish Lines along the Body. All these Kinds are plentifully in my own Fields.

As for *Outlandish Serpents*, I saw but one Kind beyond Seas different from ours. Indeed I have such a natural Abhorrency of that Sort of Animal, that I was not very inquisitive after them. That I saw was bought

bought at Rome by Sir Philip Skippon of a Man that brought them about to sell: It was very gentle and innoxious, and I suppose the *Anguis Æsculapii*; but I described it not. After a while it escaped out of the Box wherein we kept it, and hid it self that we could find it no more.

Besides these I have mentioned, I doubt not but there are divers Species of *European* and *African Serpents*; but know little of them of Certainty which we may confide in, but their Names. Of the *American Serpents* described by *Piso*, *Marcgrave*, and *Hernandez*, we have more Assurance; among which the *Rattle-Snake*, whose *Exuvie* are common in *Museums*, is most noted and best known.

Since my last, viewing the *Mosses* growing about my House, to see whether they were as yet come to the Head, I found some of them were; of which I observed no less than four Sorts of such as *Dr. Plukenet* and *Mr. Doody* call *Musci Trichoides*, but *Herbarists* generally *Adianta*, or *Polytricha aurea*, two with erect Heads, and three with Reflex, besides one which was not come yet to the Head; so that I have already discovered six Species growing upon my own House.

Meeting Yesterday with *Mr. Dale*, and examining him about *Serpents*, he confidently affirm'd to me, that he had twice seen the *Amphisbæna* in this Countrey, and named the Places: Not that there is any Serpent that hath two Heads, or a Head at each End, but only that it hath a Faculty of going backward as well as forward; and the Tail is turrit, and somewhat resembles a Head. I confess I did formerly distrust the very Being of an *Amphisbæna*; but considering that Worms, and some *Eruceæ*, can, and do move nimbly backward and forward, I see no Reason but some Serpents may do so too, and we have pretty good Authority that there are such. I was a little

stagger'd at his Assertion, but yet must suspend my Belief till I have better Assurance.

Dr. Plukenett to Mr. Ray.

S I R,

July 17. — 92.

YOUR kind Acceptance of my poor Present is an Addition to former Favours, and I give my hearty Thanks for the Pains you took in the Perusal of my Botanick Icons. I shall think mine the better bestow'd on their Production, in that you are pleas'd to give so great a Character of them. I am only sorry any thing of the desirable Exactness, in reference to your self, should escape my Notice; for tho' I have industriously design'd to avoid all exposing others Mistakes, the Omissions here are purely humane, and Slips of Frailty, without the least Partiality, or any sinister Design of derogating from the Felicity of your Parts, or the Honour that is due to the painful Discoveries you have so freely communicated to the World.

I. Your first Particular is an Instance in the *Al-sine Caryophylloides tenuifol.* &c. of my Phytography, and its Reference to that of the *Liniflore* in your general History. I confess I did make it a Question of Doubt; and the want of a closer Application to your self was the Occasion of the Misconjecture: And since it was only my Doubt, which is not without a Scope and Latitude, that being always allow'd to Questions of this Nature, tho' there be not an exact Concurrence of every nice particular, it will I hope seem more tolerable, especially when I have so good an Example as your self to warrant me herein; for I observe, even in the very same Plant, you are pleas'd
by

by way of Question to annex the *Auricula muris pulchro flore folio tenuissimè diviso*, J. B. as a proper Synonyme thereto, which does as little answer it in the *Petala* of its Flowers as mine, and perhaps much less in its Leaves.

2. Your second Objection as to the *Asparag. aculeat.* with its Reference to your *Sicilian* Sort, was but a bare Suspicion, and may come under the same Excuse.

3. The *Asarum è Terrâ Marianâ*, which I have since better referr'd as I conceive to another Genus in *Piso*, together with the *Tulipifera Caroliniensis*, which I refer to *Hernandez*, are indeed inserted in the Appendix of your History, which, however they came to slip me, I know not, I own the Failure, and acknowledge the Obligation to have taken Notice of them there: And yet to a Person of your Goodness and Candour, the Straitness of my Letter Plates will make an Excuse, for the Omission, with less Difficulty obtainable.

4. The *Euphrasia lutea latifol.* and your *Cratæogon. Westmorlandic.* which you seem so much to dislike, were design'd from the best dry'd Patterns I had by me, which perhaps were not so perfect as I could wish; and yet I should be glad to see them better figur'd any where else; the Shanks indeed of the Flower of the latter might have been made a little longer.

5. The *Hippuris lacustris mansu arenosa* was design'd from a dry Specimen I had from *Chiffelhurst*, where it grows abundantly; but the Leaves, or Dentals, are a little too long and sharp-pointed, which was a thing I complain'd of to my Graver; but it seems it pass'd without Amendment. As it is, it bears some Likeness to your *Millefol. aquat. Equisetifolium*, but in a much nearer Degree of Resemblance (in my mind) to the *Equisetum foetid. sub aquâ repens*, to which it is next a-kin.

6. As for the *Gramen spicâ laxâ pyramidali* I was positive herein, because Mr. Doody, who communicated the Grass to you, communicated your Name to me, and affixed it here. The *Gram. Phalaroid.* I believe may be your *Lusitanicum*, since mine was drawn from a dry'd Specimen I long ago gather'd in Mr. Morgan's Garden, where it seems you had yours. The *Gram. Cyperoid. lanuginos.* was design'd from the dry'd Leaf, and rather less than so large as it. Perhaps it was a Plant of the same Kind, more than ordinarily luxuriant in its Spikes.

7. As for the *Gram. Cyperoides elegans spicâ compositâ*, if there be any Mistake herein, it must lie at Mr. Doody's Door, for he it was, who with great Assurance, appropriated your Name to this very Grass, and I think writ it with his own Hand.

8. I am glad you tell me my *Lichen parvus erectus*, &c. is not what you intended by the *Lichen minimus foliolis laciniatis*, it being by so much more my own: And yet you see how unwilling I was to make it so without your farther Assurance. Indeed the Source of most of these my Failures, was the Aversion I had of multiplying Species without apparent Cause, or giving my self the Credit of a Discovery which perhaps was due to some other.

9. Your separating my *Melilotus luteus procumbens* from yours of *Messina* is truly instructive.

10. Your *Corymbifera Millefolii umbellâ* I thought must fall between the *Millefol. Tanacetifol. Moris.* and the *Ptarmica Alpin. Triumfetti.* And therefore in my Catalogue I put the doubtful *Quere* to them both, especially since to the former I find an Asterisk prefix'd, denoting you had not then seen the Plant; and therefore I could not peremptorily exclude it from a Competitorship with that to which you have now assign'd it, I confess that Passage in your Appendix had escap'd me.

11. I could almost have sworn I had been right in the Reference of my *Muscus Coralloides* to your Name of *Muscus pennatus ramulis & capillament. falcatis*; it does so exactly answer that Title; and therefore your Monition here is extreme kind.

12. The *Salix long. fol. hirsuta rosea* I did not propose as a new Species, but only an accidental Variety in the *Capræa* Kind, which I think has not any where else been expos'd in Icon.

13. As to the *Lithosperm. maj. Dod.* which is repent at the Root, you would soon be convinc'd, if you compare the other Kinds with this, which was taken from a dry'd Specimen out of Mr. Charlton's Collection, with the Title affix'd by Dr. Magnol, and which answers well enough to *Thalius's* Name, it being very twiggy in its Branches towards the Top; but whether trailing on the Ground, or not, I can't determine, as never having seen it grow; perhaps mine may be only a single Twig a top.

14. That the two *Astragalus's*, the *Stella leguminosa*, and my *Vicia Sesamacea Apula* Fab. Column. are extremely differing by their Collation, nothing can be more apparent; nor can your Argument from Dr. Magnol make any thing against it, since his, and our commonly received *Vicia Sesamac. Apula*, is no other than the *Securidaca siliquis foliaceis* of Monsieur Boccon, which has a Variety with those Affections you speak of, viz. the Pods with Foot-Stalks almost an Inch long. We may perceive Dr. Morison himself labouring under the same Mistake, when in his History of Oxford he proposes in Icon, his *Astragalus annuus rectus flore ochroleuco*, which is no other than Boccon's *Securidaca*; for the *Vicia Apula* Column. and that which is truly so, (as every body must own, both from the Figure and Description of *Columna* in his *Ecphraf.* p. 1. p. 301, and 303.) he sets down under the Title of *Astragal. annuus siliq. & fol. hirsutis*, Tab. 9. Sect 2. and makes it the same with *Fœnu-græco Sylvestri*

vestri Tragi in quibusdam accedens, J. B. as may be seen in his History, p. 109. And if ever my Catalogue see Light, these Things will be better explain'd.

15. I thank you for your kind Information about the *Cambrian Ferns*; yet methinks I cannot but be steady to the Title of *Filix pumila Myrrhidis facie*, it being a Name that in few Words so graphically denotes the thing itself.

16. The *Shrub* that grew in Mr. *Wilkinson's Garden* coming in some Disguise, and in a different Face from what I had from *Carolina*, had like indeed to have put upon me; but after it was grav'd, I acquainted Dr. *Robinson* with my Suspicions about it, and if you please to remind, you will find a Note upon it amidst its Synonyma; which, tho' it be put there only as a Variety, the Hint may be sufficiently understood, as indeed I would have it: And it is the only double Oversight (I think) committed in the whole Work.

17. As for your Suspicion of my misapplying Synonyma to the *Alth. profundè serrato S. dentato folio*, J. B. it will be soon taken off, when I shall tell you that my Opinion is, the *Thuringiaca Camerario ejusd.* J. B. is the self-same thing, tho' he seems to make them two, but with a great deal of Vacillation and wavering. And now you'll find *Casp. Baub.* Synonyma here used, reconcilable enough to what it was intended, and *Clusius's* Names will fall in pat, as you would have them.

18. If your *Ledum Alpinum hirsut. min. Cat. Exterior.* be my *Cistus Chamærhododendros, &c.* it is very different from the *Cistus pumilus Montis Baldi, &c.* J. B. tho' this be a *Chamærhododendros* too, as being a *Monopetaloid*, having but one Leaf, with some Top Division in the Flower.

19. My *Polygonum minus procumbens nivetum Glaucis exigua fol.* is undoubtedly the *Polygala repens nuperor.*

Lob.

Lob. and I believe the *Polygonum minus candicans supinum* of Dr. Magnol, tho' he upon Mistake applies it to the *Paronychia Hispanica Clus.* which is a more surrect Plant. And that the *Polygonum Verticillatum* J. B. is very diverse from this *Polygala* of Lobel, may be observ'd from the Particular of its Leaves towards the Tops of the Branches; for arriving within an Inch and a half thereof, they leave the Stalk well-nigh naked for some Space, and then, as it were to recover that Loss, they grow to the very Lip in a most close and imbricated Order, which is never to be found in the *Polygonum Verticillatum* Kind. Something of this Peculiar may be observ'd in Lobel's Figure of it, tho' the Interstice be not express'd. The *Polygon. minimum Montanum niveum & sericeum* Aldr. is no other than the *Paronych. Hisp. Clus.* a false Synonyme, and ill apply'd by Dr. Magnol to his supine Sort, which I believe to be the same with mine.

20. I must confess it was not without some Surprise upon me, that you should condemn the Collocation of my *Brassica spuria caule magis folioso*, with the *Pilosella filiquata Thalii*, in that the Stalk of mine is foliose, when the very *Pilosella filiquata* it self is not altogether destitute of Leaves upon its Stalk and Branches, as the thing it self assures, and is so represented in the Figure annex'd to the *Harcynia* by the learned *Camerarius*: But were its Stalks really viduate of Leaves, and naked, I do not see why mine, arrayed with this Ornament of Leaves, should be shut out from a Society with the other upon that Account, any more than the *Bursa pastoris Alpina minor hirsuta loculo oblongo* C. B. P. with its Leafy Stalk from the *Bursa pastoria minima verna loculis oblongis* J. B. Chabr. or the *Paronychia vulgaris* Dod. both whereof (poor Scabs) are Nudicaules; and yet I believe it were a hard Matter to obtain your Consent for a Bill to divorce them upon the Account of these inoffensive Nudities.

Mr. J. Aubrey to Mr. Ray.

Honoured Sir,

London, Aug. 5. 1691.

AS to *Lime-Trees*; p. 233. I must advertise you, that in *Bedfordshire*; there are Woods where are thousands of them, e. g. at *Chicksands* [Sir *Osburn's*] and in other Woods thereabouts; also at Mr. *Wyld's* Estate at *Totham* in *Essex*, and this I do assure you from my worthy Friend *Edm. Wyld*, Esq; Mr. *Bullock's* Kinsman. They also grow wild, but not so common in the *Forest of Dean*. In *Cranborne-Chace* [*Dorset*] are very few, and they know not their Name. As to *Shave-weed* used by Artists, [which they have from *Holland*,] we have of the same sort, and as good, in a Hill by *B* - *Abbey* in *Wilts*. I do think there is a greater variety of *Withys* than you mention; a Bencher of the *Middle-Temple* is very curious in them, but he prefers the Red-withy. King *James II^d* sent by Sir — *Garden*, to the Royal Society, a Plant call'd *Starre of the Earth*, with the Receipt made of it to cure the biting of *Mad-dogs*, which is in *Transact. Numb. 187*. By the *Salt-Pits* at *Limington, Hampshire*, grows a Plant call'd *Squat-more*, of wonderful effect for Bruises, not in any Herbal: This I had from *Th. Guidott*, M. D. whose Father had the Salt-works, and is a Witness of the Cures done by it. My old Friend Mr. *Fr. Potter* [Author of the *Interpretation 666*] told me that a Neighbour of his who had the *Gout* many Years, an ancient Man, was cured by an old Woman with the Leaf of the *wild Vine*. I came there above a Year after, and the Party had never a touch of it. *E. W.* Esq; tells me of a Woman in *Bedfordshire* who doth great Cures for *Agues* and *Fevers* with *Meadsweet*, to which she adds
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some green Wheat. A Parliament Captain [in *Ireland*] told me, when the Army was sorely afflicted with the *Bloody Flux*, and past the Skill of the Doctors; they had a Receipt from an *Irishman*, viz. to take the Partition-pith of a Walnut and dry it; then to pulverize it, and drink as much as could be heap'd on a 4^d or 6^d in Wine or, &c. and this cur'd the Army. Sir *Chr. Wren* told me once [eating of *Strawberries*] that if one that has a wound in the Head eats them 'tis mortal.

Mr. J. Aubrey to Mr. Ray.

S I R,

WHEN I was lately at *Oxford* I gave several things to the *Museum*, which was lately robbed since I wrote to you. Among other things my Picture in Miniature, by Mr. *S. Cowper* (which at an Auction yields 20 Guineas) and *Archbishop Bancroft's* by *Hillyard*, the famous Illuminer in *Q. Elizabeth's* time.

- " For an Head or Eye
- " By *Hillyard* drawn,
- " Is worth an History
- " By a worfe Painter made.—

I found among my Papers this R^e for the *King's Evil*, which I had from Dr. *Stokes*. Let the Patient chaw the Roots of *Piperitis*, and it will make him spit, and bring away the malignity, and cure the Distemper.

In another Letter of *Jan. 21. 1691*. are these Words, viz. " Mr. *Lhwyl* sent me a Letter this Week, acquainting me he hath receiv'd an Ear of Rye (but without any Grain) taken out of a Child's Side of

252 *Dr. Robinson to Mr. Ray.*

“ half a Year old, under the short Ribs, in *Merionyd-*
“ *shire.*

London, Oct. 22. 1691.

Dr. Robinson to Mr. Ray.

S I R,

London, Feb. 25—91.

ALL our Sea Officers, and understanding Seamen agree that the *Mediterranean* sets out again into the *Atlantick*; and a Gentleman who was employ'd many Years in the *Mole of Tangier*, brought back a Chart with him of this ebbing out of the *Streights Mouth*; I own 'tis scarce reconcilable to the common Notions of Philosophy, that there should be two contrary declivities or currents in the same Chancel: But the Seamen have often laugh'd at my way of reasoning, telling me, that the same thing is frequent in many Streights, as the *Hellespont* and *Bosphorus*; but more notably in that of *Negropont*. I would not be thought to byass your better Judgment, yet I must tell you that all the Scholars about the Town, who read your Book, do agree you to be under an Error: Indeed general Opinions never determine me, when I am inclin'd to think upon any Subject (which happens seldom;) and to speak the Truth, I doubt of this; tho' Dr. *Lister*, Mr. *Aston*, Mr. *Hally*, Mr. *Flamsted*, &c. are all against you, so are all the Sea-faring Men.

I told you there are many *Pectunculites*, four and six times as large as any Shell of that yet known; I speak of *England*.

The *Nautilus Shell* in *Museums* seems to me to be only the Tail of the Animal, and the *Diaphragms* thereof the *Vertebrae*; I know not how many *volutæ* the perfect Shell it self may have.

Your

Your Opinion of *Cartilagineous Fishes* poising and raising themselves seems probable to me. I am not able to resolve you about those blood Vessels of Vipers, Serpents and Fishes, which you mention.

How do the *Cetaceous Fishes* raise and poise themselves? I think they spout Water. How doth the *Lamprey*, the *Mullus*, the *Anchovie*, the *Draco marinus*, the *Tunny*, the *Drum Fish* (*Tamburo*) the *Uranoscopus*, the *Dolphin*, the *Centrina*, the *Skate*, *Torpedo*, *Rana Piscatrix*, *Scorpius major*, the *Bull Head*, &c. which Signior *Redi* in a late Book affirms to have no Air or swimming Bladder, raise and poise themselves?

Mr. Lhwyd to Mr. Ray.

Honoured Sir,

THE *Holywell Moss* seem'd to me a variety (tho' perhaps it may be a distinct Species) of the *Muscus Trichomanis facie*, &c. *Jungermanni*. The common People will not have it call'd *Mwswgl* [Moss] but *Gwiribh*; which Word is no where else used in any other signification than for a *Virgin*: And here perhaps it may allude to the *Virgin St. Winnifrid*, and might have been formerly call'd *Gwâlht Gwiribh*, i.e. *Capillus Virginis*. *Georg. Agricola* * says that the Stones smelling of *Violets*, acquire that smell from a Moss adhering to them; but *Wormius* in his *Museum*, p. 38. says a piece of one of those Stones kept in his *Museum* many Years, having no Moss adhering to it, did still retain that Scent. I design to send for some of the Moss and Stone, when I have an opportuni-

* De Nat. Foss. l. 1. c. 5.

ty, and then we may hope to be able to judge better of this *Phænomenon*. I have sent to my Correspondent to enquire farther about the Truth of the Relation of the *Ear of Rye*: Mr. *John Aubrey* writes to me, that he could give a guess how the Ear might come in, but that it would not be fit to be inserted in a Letter. In the same Letter he acquaints me that a young *Cornish* Gentleman assures him, that he has lately observ'd in *Catalonia*, and amongst the *Pyrenean Hills*, many *British Words amongst the Natives*. I did not think that any young *Cornish* Gentlemen had understood *British*; however this wants a Confirmation, and 'tis possible this Gentleman having pick'd out five or six parallel Words (which is easily done out of any Language in these Parts of *Europe*) took it for granted, from their guttural pronounciation, that there might be many more. “ He † informs me that he
 “ was present when a Stone was broken by Work-
 “ men, which lay upon the top of the Ground, where-
 “ in was contained a *Toad*; in Form and Colour al-
 “ together resembling the common one, tho' some-
 “ thing less; which being laid upon the Ground
 “ crawled about as long as the Sun shone warm up-
 “ on it, but towards Night died. I examin'd the
 “ Stone (says he) and suppos'd it at first to be of an
 “ extraordinary open texture, or else the hole where-
 “ in the *Toad* lay to have some private communica-
 “ tion with the Air; but upon a more strict enqui-
 “ ry I found the Stone of a close Grit, but that place
 “ especially where she lodged, to be of a much har-
 “ der texture, much of the nature of the Iron Stone
 “ which the Workmen call an Iron Band.

Upon the reading your Discourse of the *Rains continually washing away, and carrying down Earth from the Mountains* *, it puts me in mind of something perti-

† Dr. Richardson of North Bierley in Yorkshire.

* *Dissol. of the World*, p. 44.

ment thereto, which I have observ'd in the Mountains of *Caernarvonshire*, viz.

1. First, That generally the higher the Hills are, the more steep are their Precipices and Declivities, (I except the Sea Rocks) thus *Moel y Wydhrba*, y *Grib gôtch*, and twenty others that might be named, reputed the highest Hills in *Wales*, have the steepest Rocks of any Mountains I have seen; and that not only in their highest Cliffs, but also in most of their other Craggs, till you descend to the lower Valleys: This I can ascribe to nothing else but the Rains and Snow which fall on those great Mountains, I think, in ten times the Quantity they do on the lower Hills and Valleys.

2. I have observ'd a considerable Quantity of the Chips or Parings (if I may so call them) of these Cliffs to lie in vast Heaps at the Roots of them; and these are of several Sorts and Materials; being in some Places cover'd with Grass, and in others as bare as the Sea Shore: And those bare Places do consist sometimes of Gravel, and an innumerable Number of Rock Fragments, from a Pound Weight to twenty, &c. and are sometimes composed of huge Stones, from an hundred Pound Weight to several Tuns.

3. In the Valleys of *Lhanberys* and *Nant-Phrancon*, the People find it necessary to rid their Grounds often of the Stones which the Mountain Floods bring down; and yet notwithstanding this Care, they often lose considerable Parcels of Land.

4. I affirm, That by this means not only such Mountains as consist of much Earth and small Stones, or of softer Rocks, and such as are more easily dissoluble, are thus wasted, but also the hardest Rocks in *Wales*; and they seem to be as weighty, and of as firm and close a Texture as Marble it self. It happen'd in the Valley of *Nant-Phrancon*, Anno 1685. that Part of a Rock of one of the impendent Cliffs, call'd *yr Hysvaë*, became so undermined (doubtless
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by the continual Rains and subterraneous Veins of Water occasion'd by them) that losing its Hold it fell down in several Pieces, and in its Passage down a steep and craggy Cliff, dislodged thousands of other Stones, whereof many were intercepted e'er they came down to the Valley, but as much came down as ruin'd a small Piece of Ground; and several Stones were scatter'd at least 200 Yards asunder. In this Accident one great Stone, the biggest remaining Piece of the broken Rock, made such a Trench in its Descent, as the small Mountain Rills commonly run in; and when it came down to the plain Ground, it continu'd its Passage through a small Meadow, and a considerable Brook, and lodged it self on the other side it. From hence I gather, that all the other vast Stones that lie in our mountainous Valleys, have by such Accidents as this fallen down: Unless perhaps we may do better to refer the greatest Part of them to the universal Deluge. For considering there are some thousands of them in these two Valleys [of *Lhanberys* and *Nant-Phrancon*] whereof (for what I can learn) there are but two or three that have fallen in the Memory of any Man now living; in the ordinary Course of Nature we shall be compelled to allow the rest many thousands of Years more than the Age of the World. But I have been too tedious in things that are no information to you, for which I must beg your pardon; tho' I cannot forbear to add two other particulars, which seem'd very singular. First. At the highest Parts of the *Glyder*, (a Mountain about the height of *Cader Idris*) there are *prodigious heaps of Stones*, many of them of the largeness of those of *Stonehenge*, but of all the irregular Shapes imaginable, and they all lie in as much Confusion as the Ruins of a Building can be supposed to do. Now I must confess I cannot well imagine how this has happen'd; for that ever they should be indeed the ruins of some Edifice, I
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can by no means allow, in regard that most of them are as irregular as those Stones are that have fallen to the Valleys; we must then allow them to be the Skeleton of the Hill exposed to open view by Rains, Snow, &c. but then how came they to lie across each others in this Confusion, some of them being of an oblong flat Form, having their two ends, *ex. gr.* *E.* and *W.* others laid athwart these; some of them laid flat, but many of them inclining being supported by other Stones at the one end, &c. I must confess I have seen nothing that appear'd to me so strange as this in all those Mountains. Had they been in a Valley I had presently concluded they had fallen from the Neighbouring Rocks, but being on the very summit of the Hill they seem to me unaccountable. I know it might serve to confirm Dr. Burnet's Hypothesis, but for my part tho' I admire his Learning and Ingenuity, yet I must confess I cannot (as yet) reconcile his Opinions either to Scripture or Reason; tho' I have not seen either of those Books that are written against him. The other Observation is not so unaccountable as it is singular, and in some respects opposite to the former, *viz.* on the *N. W.* side of the same Hill there is, amongst many others, one *naked Precipice*, as steep as any I have seen; but so adorn'd with *numerous equidistant Pillars*, and these again slightly crossed at certain Joints, that should Dr. Burnet see it, I believe he would say it is one small Pattern of the Frame of the *Antediluvian* Earth. I must confess I admir'd it almost as much as he does (*lib. 1. c. 9.*) his Precipice by the *Mediterranean* Sea; to which, after a long Encomium, he says, *Vale Augusta sedes rege digna*, &c. though I must grant that the Shepherd, who was my Guide, was far from wishing himself a Mansion at this Palace.

Oxf. Feb. 30. 1691.

Mr. Ray to Dr. Robinson.

S I R,

WHAT you write of the *Pædunculites* found in England, I grant to be true, in comparison with any *Pædunculi* commonly known; but there may be such Species found in our Seas which do not appear, but lye among Rocks, or in great Depths. And that this is not a mere *Subterfuge*, and altogether *gratis dictum*, I will give you an instance of a *testaceous Fish*, that is the *Echinus marinus*, three or four whereof Mr. Willughby and my self found, and took up alive in the Sea, among the Rocks between the *Isle* and *Calf* of *Man*, of that kind and bigness, as I never heard before to have been found cast upon our Shores, or drawn out of the Sea by our Fishermen; they were as big as both my Fists. I have seen of them in *Italy*.

You must excuse me if I think the *Nautili* Shells, that are frequent in *Musæums*, are entire Shells, and not broken pieces; for in such as I have seen there is no appearance of any fracture, and the enormous wideness of the Mouth argues it not to be broken: And besides, I my self have taken up on the Shores of the *Mediterranean* small *Nautilus-Shells* of the striate kind entire, which for the shape and turn were like to the common great *Nautilus-Shells*.

How the *Cetaceous Fishes* raise, sink, and poise themselves in the Water, is, I think, clear enough, and the Dolphin, you know, is of that kind; and for the other Fish you mention out of *Francisco Redi*, the *Centrina*, *Skate* and *Torpedo* are Cartilagineous. Of the rest I do not find mention in my Notes of any swimming Bladder they had, excepting the *Uranoscopus*,

copus, which I do expreffly fay had a fmall one. Thofe Fifhes are farther to be examin'd. The *Lamprey*, I believe, cannot raife it felf up in the Water, and I doubt whether the *Bull-Head* do or can.

As for the *contrary Currents at the Streights*, if they be at the fame time, your Argumentation muft needs be good: And Mr. *Smith*, who was upon the Spot, and on purpofe to enquire and obferve, acknowledges no fuch thing; but infifts upon an under Current: And as for the *Thracian Bosphorus*, he confidently affirms that the Current constantly fets outward, I mean from the *Euxine Sea*. I am not concern'd that the Current (at the *Streights*, I mean,) fhould constantly, and only fet inward, and it would fuit my Hypothefis better that it fhould be indifferent.

I have read over your *Peyers Merycologia*, and do own him to be an ingenious and careful Writer; but yet in fome few things I muft needs differ from him, they being contrary to my Opinions and Obfervations. For I have many Years ago, with as much diligence as I could, examin'd the Stomachs of Kine.

I doubt whether Mr. *Lewenhoeck's* Obfervations be exact; for in thofe of the Seeds of Plants I find him miftaken in fome, *v. g. Radifh, Turneps*, and others of that kind, which I have forty times difsected and open'd with my Hands, and feen clearly with my naked Eyes. He faith they have four Leaves, and figures them accordingly, whereas they have but two only, with a notch or *crena* at the top; but that not very deep, fo as to make any fhew or appearance of two Leaves. And it's clear, by their coming up, that they have but two Leaves, for they bring up the very fame that were enclosed in the Seed. And Signior *Malpighi* agrees exactly with me both in the number of Leaves, and the manner of their complication, both in his Figures and Descriptions.

B. N. March 3^d.—91.

Mr. Ray to Dr. Robinson.

S I R,

SINCE my last to you I find that our *Fallow Deer* is not the *Cervus palmatus* of Gesner, but by the consent of Clusius, Bellonius, and Peyerus, the *Platyceros* of Pliny, lib. 2. c. 37. described by Bellonius, but in some particulars erroneously, v. g. with a long Tail. It is vulgarly call'd *Dama*, but is not the *Dama* of the Ancients. The French call it *Dain*, and the Germans *Dam-hirsch*; so that what the *Cervus palmatus* is I am yet to seek.

I am at some loss about the place of the *Camelopardalis*. I think there is good reason to place him among the *Ruminantia cornigera*, but whether he be of the *Cervinum* genus or no, is questionable, seeing his Horns are not ramose, as all the rest of that kind are.

In the Year 1667 I saw in the Strand a strange Animal, (Deer they call'd it) of which all the Notes I took are these: It was near of a Fox-colour, its Body bigger than a Goat, but of a like make; the Horns black, not branched, once wreathen, not large; the Ears long, and hanging down like a Hounds. It had two Wattles under the Throat, such as are seen in some Hogs. I saw it eat Hay and Barley, and it was very tame. If the Horns of this Creature were round, which I am in some doubt of, it's clear that it must be some Species of *Gazell*.

Your conjecture that *Poor John* is nothing else but the *Hake* salted and dried, seems to me very likely;

ly; but where they may be had I desire demonstrations.

I never very curiously observ'd *Trouts*, because they do not often come in my way, there being none in the Countrey near us. I believe I was 30 Years of Age before ever I saw one. *Sprats* I know to be nothing else but the young fry of *Herrings* and *Pilchards*; both which Fishes come to their full growth in a Years time or less, and then breed. Upon this occasion I will communicate to you a particular which hath a long time perplex'd me, and that is, *whether all Fish cast all their Spawn at once*: I mean in one Year, or only part of it, retaining part for future *partus's*. That *Herrings* cast all I am confident, finding none in shotten *Herrings*. It is a Principle with me that all Animals have, from their very first formation, the Eggs or Seeds of all the Young they shall ever bring forth; for when they are once exhausted and spent, the Animal becomes effete. Now a Fish at every birth casting forth such an innumerable number of Eggs as are contain'd in her whole *Row*, it seems strange there should remain Seed-Eggs enough, let them be never so small, as to suffice many years Births; and yet the whole Mass of them together to be so little and inconsiderable, as not to be so much as taken notice of by any Naturalist.

I find among my Papers a short Description I took of the Skeleton of the *Elephant*, in the Duke of *Florence's Musæum*, and therein this Description of the Bones of the Feet. The *Toes* of the fore-Feet, or rather the Bones of the *Metacarpium* are five; for it hath properly no *Toes* at all, but only five *Ungulæ* upon these five Bones, which appear without side the Skin. The like is said of the Bones of the *Metatarsus*, in the hind-Feet: It follows, the *Ungulæ* of these hinder-Feet are small, round, and blunt. So it seems this Animal hath that peculiarity to have no *Toes* in his Feet. And it is doubtful whether his Nails be

Ungulæ

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Ungulæ or *Ungues*, they being round and blunt, and covering the very tops of his Toes.

B. N. April 15—92.

Sir Hans Sloane to Mr. Ray.

S I R,

London, May 20th. 1692.

I Have lately seen a Collection of *Petrifications* with Mr. *Beaumont*; amongst the rest is the *Lapis Astroites*, which is a sort of Coral generated in the Seas between the Tropicks; and it seem'd to be so clearly that, as nothing plainer. 'Tis turn'd to Flint, and the Interstices between the starry Pores are transparent. One of this kind he shew'd to me was half petrify'd, the other half remaining, like a common Star Stone. He shew'd me likewise many Impressions of several Plants in *Slatt*, as *Ferns*, *Flags*, &c. very fair and plain, with several Stalks of Plants petrify'd and enclos'd in Flint, which he talks of publishing together with some Figures of, and reasonings upon them.

Mr. Ray's Answer to Dr. Robinson.

S I R,

I Recciv'd yours of March 20th, in an answer where-to I can only tell you as to the first particular, about *Bisulc* and *Quadrifulc*, that the Reasons why I conjecture the *Rhinocerot* and *Hippopotamus* to be 4^{drifulc} are, (what I intimated before) the bigness and position of the outward Hoofs, as they are represented in the Sculps, not being set at that distance

as

as they are in Bisulc Animals; and the Authority of *Columna*, as to the *Hippopotamus* who (had the hind *Ungulæ* been like to, and situate in like manner, as in other Bisulc Animals) would never have made such a Remark upon it, viz. that its Feet were *Quadrisulc*.

As to the second concerning the *Viper*, I believe that the Eggs have no Cohesion with the *Uterus*, neither the Young; I have easily turn'd the Eggs out. And in the Young, when ready for exclusion, I have indeed observ'd a Navel String; but it seem'd to be nothing but one single Membrane, which serv'd only as an *Infundibulum* for the Yolk of the Egg into the Intestine of the young *Viper*; just as I have seen in young *Dog-Fish*, in the Belly of the old one, half, or a good part of the Yolk hanging out of the Body at the *Infundibulum*. It seems to me not at all likely that Creatures of the same *Genus* should have a different manner of Generation; and we see this hatching of Eggs, properly so call'd, in the Belly, exemplify'd in *Cartilagineous Fish*.

I have some reason to doubt of what you and Dr. *Tyson* write concerning *Adders* having no *Vesiculæ Seminales*. A Male that I dissected had a long *Vesicula* replete with Sperm, (as I took it to be) like the Milt of a Fish, extending the whole length of the Belly; but I did not carefully examine it, and therefore might be mistaken, and it might be nothing but fat.

B. N. June 1.—92.

Mr. Ray to Dr. Robinson.

S I R,

OUR principal Physician at *Braintree*, Mr. *Allen*, my Acquaintance and Friend, hath discover'd hereabouts *flying Glow-worms*; and I doubt not but they

they are every where to be found, being nothing else but a kind of long-bodied Beetle, though they shine not in this Countrey. They answer exactly to *Aldrovand's* Description of the *Cicindela volans* of *Italy*. The reason why I mention this, is because this Gentleman meeting with this Beetle, and finding by strict Observation that the Body of it answer'd exactly in Figure to that of a creeping Glow-worm, suspected it to be the *Male Glow-worm*; and having some creeping Glow-worms by him, put this Animal into a Box with one of them, which after some short time coupled with it: But because the Box whereinto they were put was small and shut, to confirm the Experiment, he put a creeping Glow-worm into an open Box, and a flying one to her, which fluttering with his Wings, did presently, in his sight, march to the creeping one, and couple with her. How this can accord with what *Mr. Waller* delivers of the winged *Cicindela*, that they are both Male and Female, and couple together, I see not, unless we say that there are two sorts of flying Glow-worms; the one sort having both Sexes flying, and the other being the Male of the creeping. For *Dr. Plot's* Salvo will not here serve the turn, *viz.* that the Animal in which *Vintimiglia* made the first Experiment, might be prurient with Lust, and being shut up in a Glass with creeping Glow-worms, might couple with them, as Horses do with she-Asses. For in our Case the flying Glow-worm was not pamper'd, as wild Creatures seldom are, nor with-held from those of his own Kind for some time, and was at his free liberty in the Box to take his flight away.

B. N. July 8.—92.

Mr.

Mr. Lhwyd to Mr. Ray.

Honoured S I R,

Oxford, Octob. 7. —92.

W H E N your last Letter came, I was at London about a *Legacy of Books, Medals, and Pictures*, bequeathed by Mr. *Ashmole* to the University; since which Time I have been so continually employ'd in taking a Catalogue of them, that I have had but small Leisure to go abroad to make any Discoveries.

My Discoveries in *Form'd Stones* of late are but few. I have a Stone almost a Foot long, (but broken in several Pieces) something of the Colour, Shape, and Politeness of a *Rhinocerot's Horn*, which perhaps is congenerous with that they call *Unicornu Fossile*: And have also found at *Witney* and *Charleton* in *Oxfordshire*, and *Faringdon* in *Berkshire*, several very odd petrified Bones, to me at present unaccountable, and like to continue so, at leastwise a long time. At present I only suspect them to be the Bones of some marine Creatures: 'Tis certain they differ totally from the Bones of any Land-Animals at present in the Island; and we have no reason to imagine that this Countrey was possessed anciently of any other Land-Animals than what it is at present, unless we should give way to Dr. *Burnet's* Hypothesis, or some such other Invention. I have also two Fossils, which seem to be Fragments of Fish-Jaws petrified, each of them having their Teeth (to wit *Toad-stones*, or the *Occhiedz Serpi* of the *Maltese*) placed in their natural Order, as they are in the *Lupus*, and probably in some other Fish. I have likewise discovered very elegant Stones of those Kinds, which I have called *Siliquastrum* and *Punctularia*. As for the *Cornua Hammonis*, I am now satisfy'd they are all of the *Nautilus* Kind, and of

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such-

such-like Shells; but as you say, what's become of all these Species, if they are petrified Shells? I say they are all of the *Nautilus* Kind, not that any of them scarce resemble the known Species of *Nautili*, (for such as do have been called by *Calceolarius* and *Morcardo*, *Nautili*, &c. and not *Cornua Hammonis*) but because they consist of several Articulations, which is a Structure agrees with no other Shells but the *Nautili*. The *Sutures* upon them, which *Boccone* and others compare to Oak-Leaves, are nothing else but the Commissures of the Joints; and these Joints nothing else but the Spar, or other Stone, filling the Cavities of the Cells in the *Nautilus*: And this I conclude from one or two Specimens I have found, which have the Shell still remaining in the Interstices of the Joints. That Figure of the *Joints* which I compared to *Vertebræ* is acquir'd from the Shape of the *Septum*, or Partition in the Shell. I think *Olaus Wormius* was the first that compared any *Cornu Ham.* to a *Nautilus*.

Capt. Hatton to Mr. Ray.

SIR,

Octob. 25. 1692.

THOSE few *Plants* of *Rauwolfius's* Collection, publish'd in the Appendix to the *Historia Lugdunensis*, got him so great Fame amongst the Lovers of Botany, that I have heard *Isaac Vossius* declare, above 400 l. Sterling had been offer'd for the 4 specious Volumes he had of dried Plants collected by *Rauwolfius*; and to most Strangers who came to see his deservedly famed Library, he constantly shew'd those amongst his other most valuable Books: And very few Books writ in any modern Language are mention'd

mention'd with a higher Encomium than *Rauwolfius's Itinerary* is ; but being printed about 100 Years since, it is very rare, and being never translated out of high *Dutch*, (in which Language it was writ) it is unintelligible to those who do not understand the *German* Tongue, which occasioned me some Time since, in Discourse with our learned and ingenious Friends, Dr. *Sloane* and Dr. *Robinson*, to express my Sentiments, that I believ'd a Translation of it into *English* would be very acceptable to all the ingenious Persons of our Nation ; and they both concurring in my Opinion, Dr. *Sloane* borrow'd it out of the Library of the Royal Society, and Mr. *Staphorst* is about the Translation of it into *English*, and hath near finish'd it. But before it be publish'd, it would be very necessary, not only that the Style of the Translation (which is perform'd by a *German*) should be corrected by a Master of the *English* Language, but that the Author himself should be animadverted on in some Places. The learned and famed *Ludolphus*, in his incomparable Commentary on his *Æthiopick History*, hath reprov'd him, for asserting that the *Unicorn* was in the *Abyssin's* Countrey. But *Rauwolfius* doth not pretend to have been there, only relates it from one, his Affection to whom had bias'd his Judgment ; and it is much to be fear'd, that even the perspicacious and judicious *Ludolphus* himself may have been imposed upon in some things he asserts by the Credibility he gives to the Relator. And considering, that since the Time *Rauwolfius* travell'd into *Asia*, the Manners and Customs of those Countries may have been alter'd and chang'd ; and some have been more fully discovered than he could in his short Stay in those Parts. It was highly to be wish'd that some Person, duly qualified for such an Undertaking, would, where requisite, make some brief Animadversions and Dilucidations : And if any Person of great and deserved Fame would in a short Preface give some Account of

the Author, (whose Life is not as I know related by any Person but *Melchior Adamus*, and that with his wonted Brevity) and by a favourable Character of the Work give it a Recommendation, it would be an Invitation to all ingenious Persons to peruse it; for which Atchievment there is no Person on Earth so duly qualify'd as the justly renown'd *Ray*. Therefore pardon me, Sir, if I join my humble Desires to those of our afore-mention'd worthy Friends, that you would please to give a new Life to *Rauwolfius*, put him into a fit Garb and Dress to appear in, and by your Passport and Recommendation, make his Converse not only acceptable, but desirable to all the ingenious Men of our Nation, which if you will please so far to condescend as to perform, Mr. *Smith* engages to return you in a fitting Manner his Thanks for the Benefit he shall receive by the Book, being thereby render'd much more vendible; and all Persons of Learning or Ingenuity will, I doubt not, acknowledge it as an Obligation from you to them.

Whilst I am now writing, a *Westmorland* Acquaintance of mine coming to see me, in Discourse did accidentally mind me of the Surprize I was in, some Years since, at *Lowther Hall* in *Cumberland*, the House of Sir *John Lowther*: Seeing at Sir *John's* Table a fresh Water Trout, which was 38 Inches in Length, and 27 in Girth, taken in *Hull's Water*, a large Lake in *Westmorland*, in which, I was assured by Sir *John*, and other Persons of unquestionable Credit, *Trouts* of that Size (nay larger) are frequently taken. I thought fit to mention this to you, not knowing whether you have seen or heard of these *Trouts*, or any other of that Bigness, commonly taken in *England*. I am, Sir, to your self, Lady, and Family, with all due Honour and Regard, &c.

Mr.

Mr. Aubrey to Mr. Ray.

S I R,

London, December 15. 1692.

THERE are *Water Black-birds* about *Rentcomb* in *Cotswald*, which I never heard of before, &c. Mr. *Gibson* of *Queen's-College, Oxon.* of *Westmorland*, saith, that in *Westmorland*, *Eagles* do breed in *Willow-Cragg* in the Parish of *Bampton*.

I remember the *Salt-petre Men* told me heretofore, that in Ground abounding with *Salt-petre* they find a little yellow Insect, as yellow as Gold, which is a good Indication to them for *Salt-petre*. In Mr. *Wild's* Woods, at *Totham* in *Essex*, an *Eagle* was kill'd about 8 Years since, whose Wings extended 9 Foot long. Mr. *Wyld* has one of the Feathers.

Mr. Lhwyd to Mr. Ray.

S I R,

THE Account you have been pleas'd to give me of your *Traët concerning the Dissolution of the World*, makes me think it very long till I see it. Your Discourse of *Form'd Stones* comes in very opportunely, and indeed must necessarily affect the Reader with its Novity and Clearness of Argument.

As to the *Fossil Oysters*, and my other Observations of late in this Kind, they do I must confess confirm me in my Apostasy; for I have been inclined to a Misbelief of their being Mineral Forms, ever since I found the first *Ichthyospondylus*, viz. above a Year since. If I had Abilities of travelling one or two Summers,

Summers, I believe I could make this Matter clear enough, and beyond Dispute.

I have also an *Ear of Rye out of Dolgelke Parish, Meirionyddshire*, that was taken out of the Side of an Infant. The Truth whereof is so well attested, that as yet I fully believe it. When the Child was born, he had a Protuberance on the Left Side under the Ribs, about the Bigness of a Small-Nut; all the Sustenance given him for six Weeks he vomited, and did not thrive at all: About which Time the Knob broke; and the Mother surpriz'd at some odd thing she saw therein, call'd to her Husband, who observing the Straw End to peep in and out, as the Child cried, or was quiet; he held it between his Nails, and pluck'd out this Ear. The Mother apply'd a Plantain Leaf to the Sore, and 'twas well in 24 Hours. Your Opinion how it came there would be acceptable. My Lord of *Bangor* has sent to me to desire your Opinion of the *Holywell Moss*, as to its sweet Scent. 'Tis very true that it smells sweet (as I myself experienced *Anno 88.*) at the very Place. Whence it acquires its Scent is the Question: My Lord thinks it sweeten'd by Art; but then he knows not perhaps that it has that Smell in its native Place.

Oxford, Dec. 20. —92.

Sir Hans Sloane to Mr. Ray.

SIR,

London, Feb. 16. 1693.

I Should have some time since given you my Thanks for the Favour you did me in sending me one of your Books of *Physico-Theological Discourses*; which I now do, assuring you at the same time, that you have me very much at your Command and Service.

I have

I have perused most part of *Rauwolf's Voyage*; which being only extant in *High Dutch*, and that understood by very few, I thought would do well in *English*, and so borrowed it from the Royal Society: And Capt. *Hatton* being desirous of it likewise, we put it into the Hands of Mr. *Staphorst*, who has done it as you see, I think pretty clear; tho' the making it good Language, and the Notes, are left wholly to you. Some Passages are not to be well translated, because of differing Customs and Proverbs; but I think so far as the natural History is concern'd it may be understood. Authors make Mention of a fourth Part of this Work printed the next Year, *viz.* in 1583, which is very true; for some of the Plants of *Rauwolfe* mention'd by him, and described in this Journal, were engraven in Wood, and without any farther Descriptions, only References in the Margin to the Descriptions in the Pages of the Journal, make up a fourth Book, or Part; which, with a new Title Page, was what made the second Edition; the Book in Pages, &c. without Cuts, and of the first Edition in 1582, being exactly the same as with the fourth Part, and Cuts, in 1583. The Compiler of the *Historia Lugdunensis* at the latter End, in an Appendix, takes all these Cuts, bating some few, which had been graved in the Body of that History; and adding the Descriptions out of the Journal to the Cuts, makes that Appendix which we have at the latter End of that Work. I think this Work a very curious one in several natural Remarks, as in the *spiral cutting* of the *Poppy-heads*, in making *Opium*, &c. I have likewise solicited hard to get one *Martin's* Book of *Greenland* translated and printed. It was done in-to order from his Mouth by *Martin Fogelius* of *Hamburg*, and there printed 1673 in 4to. with many Cuts of Birds, Plants, &c. of those Parts, and is not extant that I hear of in any Language but *Dutch*. I have seen two Plants from the *Cape of Good-hope*; they
are

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are both coniferous Trees, and one has a Seed pap-pous, or rather feathered, like the Seeds of *Viorna*; but with those Seeds of Feathers sticking between the Scales, it makes one of the loveliest Cones I ever be-held, if you add that the Leaves are covered with the longest, whitest, and thickest *Tomentum* I ever saw, being else like to the Leaves of a Willow. The other Cone has its Seed in the middle, and not be-tween the Scales, but at top of the Cone together; and is also feathered.

Mr. Ray's Answer to Sir Hans Sloane.

SIR,

YOU have done well in procuring *Rauwolf's* Iti-nerary to be translated and published in *English*. I wonder indeed so good a Book hath lain so long locked up in *High Dutch*. The Translator hath done his Part as well as could be expected from a Foreigner: I have revised it, and alter'd the Phrase and Language where I thought it less Grammatical, or consonant to the Idiom of the *English* Tongue, or to the Words approved now, by Use among the learned and civil Part of the Nation. Annotations (either parallel or additional out of other Writers, or corrective, or sig-nificative of the partial Alterations of Customs and Manners since *Rauwolf's* Time, which, as Captain *Hatton* suggested to me well, must in all likelihood have happen'd in the Space of above an hundred Years) I have had no Leisure to add, but have re-ferred that Task to Dr. *Robinson*, who I hope will perform it well. A *Catalogue of more rare Oriental Plants* growing in those Parts where *Rauwolf* travel-led, I have drawn up, to be added to the End of the
Work,

Work, referring such as are found therein to the Page where they are mentioned or described.

The Work you mention of *Martin's*, &c. must needs be a curious Piece, if well done, and deserves to be translated and published: If well done I say; for if *Martin* did not take Notes from the Plants and Animals lying before him, but dictated to *Fogelius* from his Memory, his Descriptions cannot be exact.

The two Trees you mention from the Cape of *Good-hope* are very curious, singular and extraordinary.

I am sorry my Book wanted the Advantage your Memoirs and Figures would have given it, in reference to the *Earthquake at Jamaica*: But my Description and Notes concerning it were huddled up in Haste, (the Press stopping all that while) and sent up to *London* in loose Papers, as you may perceive by the Confusedness of them; and truly you did not then come into my Mind, else I should have made them stay a little longer, till I had written to you concerning it. If ever the Book come to another Impression, they may then be added to it.

Black Notley, April 10. --93.

Mr. Lhwyd to Mr. Ray.

S I R,

Oxford, Dec. 12. 1693.

I Observed near *Kidwely* in *Caermardbinshire* this last Summer, that the *Gryllo-Talpæ* live there in the Sea-Lands that are covered every Tide. I brought one of them with me, and cannot find that they differ from those of the Midland Countries. In *Wales* they are called *Rhing y Lês*. q. d. *Stridor æstivitatis*.
I am, &c.

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The Reverend Mr. Paschal to Mr. Ray.

SIR,

THERE seems to be throughout the Universe a *Mutual Contranitency* between Parts Central and Circumferential; those emitting and propelling outwards; these resisting and repelling inwards. Of this I have three Instances now in my Thoughts.

1. In this, or any other Planetary System the Sun sends forth, chiefly by its Ecliptic Parts; and the ambient fixed Stars in their respective *Æthers*, and according to their Powers, give Bounds, and beat back, from whence proceeds a Plenitude as absolute and entire, and close, as the Nature of such a Fluid can admit of.

2. In this, or any other Planet, the internal Solar Matter inclosed in its *Cortex*, moving rapidly about its own Axis, continually steams out most directly and vigorously in the Equinoctial Parts: And the encompassing *Æther* is always, according to its Power, giving Limits to those Steams, and driving them back.

3. In all those particular mixed Bodies, made so as to send outward, chiefly whatever Individuals in any of the three Kingdoms of Nature, there is an internal Principle, or Agent, causing *Effluvia* to come forth: And in the Atmosphere, in which they are, a Resistance to these Motions outwards, suitable to the Nature and Motions of its Parts, and the Determinations belonging to those Motions.

Sir, I fancy, but with Submission to better Judgments, that if these three were with Application and Diligence look'd into, they might contribute something towards an Explication of sundry *Phænomena* in Nature,

Nature, such as, first, *Gravity*, by which I understand the *Vis Centripeta* in the Parts of a Planet, whether united, or to some certain Distance separated from it. This seems to be a natural and necessary Result from such a Plenitude as is named above. Secondly, the Order, Distances, Motions, which their Regularity in the Planetary System of the Planets, whether primary or secondary, being and moving therein. Thirdly, those *Æstus Atmosphææ*, or Air-Tides, to which my last referred, and those sundry Variations of the Air, and Effects considered in Meteorology, which possibly may be found to owe their Original to, and to depend upon, those opposite Pressures proceeding from Parts Central and Circumferential, acting and re-acting upon one another. As for the Vigour I noted to attend the Diurnal Motion of the Earth about its Axis, toward the Moon, in the Southing and Anti-Southing Senaries, I am by many Observations inclined to think that it comes from the terrestrial *Effluvia* in those Times at liberty to flow forth more plentifully. And consequently the Abatement thereof in the Ebbing Senaries is from Advantage then coming to the Circumferential Pressures, at liberty to repress these Effluxes from within the Earth.

Fourthly, Culinary and Vital Fires, both which Kinds move *à Centro*; particularly Life, as to its Nature, Original, Progress, State *sane* or *morbose*, Decay and Dissolution, may have some Light from a nearer and accurate Inspection into these. Sir, my narrow, and but late Observation, and that much interrupted, supplies me with enough to make a Volume upon this noble Subject.

But if there be any thing worth Regard in what I here offer, he to whom I write will see it without large Discourses. And if there be nothing, I have in this already said too much. I am, &c.

Chedsey, near Bridgwater, Jan. 20. 169 $\frac{3}{4}$.

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P. S. Lately reading Mr. *Leweng's* Observation of Scales in our Skin, it gives me occasion to reflect upon the wisdom of Nature, in providing for the regulating of Transpiration. That the circumferential pressure may not hinder it too much, Fishes (in their Elements) need a stronger and larger Scale than we do in ours.

This Hypothesis its learned Author applies in his following Letters to the Solution of divers Phænomena, as *Magnetism*, the Variations of the *Weather*, the *Tides*, and their *Senaries*, and the Things he imagines to happen in them (of which see the *Philos. Trans.* N^o. 202.) Also to the repositing of *Fossile-Shells* in high Mountains, the *Life* and *Health* of Animals, and some other Matters. But because the Letters are long, (not to say tedious by reason the Hypothesis is abstruse, and somewhat strained) I have thought they would take up too much Room, unless I could have been so happy as to have obtain'd Mr. *Ray's* *Answers*, which no doubt were very considerable; but that I could not do with my greatest Diligence.

W. D.

Mr. Ray to Dr. Robinson.

S I R,

YOU are, I perceive, not as yet satisfied with the Addition of *Provincial Catalogues* to *Camden*: To which I reply, that I am not concerned for the Beauty or Decorum of the Work; let the Undertakers look to that. As for these Catalogues, I have promised them, and they have accepted, and I must be as good as my Word. I have already sent up those from *Cornwall* to *Kent*, and have received a Letter of Thanks from Mr. *Gibson*, who manages the whole Work for them, and seems by his writing to be a good Scholar; and ingenious Person: So that I perceive they have a great Opinion of my Contributions, and better I think than they do deserve. I have

have upon your Suggestion made more Additions to *Cornwall*: As first, I have given them a general Catalogue of all the *Sea-Fish* taken on those Coasts with Synonymes. 2. A Catalogue of the more rare *Sea-Fowl*. 3. An Account of two or three Sorts of *Stones* digged there. 4. A short Account of the *Improvement of the Soil* by Sea-Sand. 5. A more full Description of some *Antiquities*, viz. the *Hurlers*, and other *Stones*. 6. Something of the *Manners* and *Language* of the present Inhabitants. As for other Counties, I told them I had neither Will, nor Skill, nor Leisure, to do the like.

The *Metals*, *Minerals*, and other *Fossils*, are many of them taken notice of by *Camden* in the Places where they are found: And as for the Plants, had he known what had been rare and peculiar in every County, I perceive, by what he hath done in some, he would have mentioned them in the Places whereof they are native. And now that I am speaking of *Local* or *Provincial Plants*, give me Leave to tell you that I think you labour under a Mistake, in thinking and asserting, that few or no Plants are peculiar to this or that Shire. Be pleased to resolve me where *Calceolus Mariæ*, *Christophoriana*, *Lysimachia lutea flore globoso*, *Pentaphylloides fruticosa*, *Polygonatum floribus ex singularibus pediculis*, *Pyrola folio mucronato serrato*. *Pyrola Alpinæ flore Brasiliæ*, *Ribes Alpinus dulcis*, *Salix pumila montana folio rotundo*, *Sedum Alpinum Ericoides cæruleum*, *Sideritis arvensis latifolia hirsuta flo. luteo*, *Thlaspi foliis Globulariæ*, *Lunaria vasculo sublongo intorto*, and *Valeriana Græca* grow wild but in your own native Country of *Yorkshire*. I could give you as large a Catalogue of *Peculiar*s in the little County of *Westmorland*. But to instance no more particular Shires; I shall only add, that I know very few Counties in *England*, wherein I could not instance some *Peculiar*s. But I am come to the End of my Paper.

Mr.

Mr. Ray to Dr. Robinson.

S I R,

B. N. April 11. —94.

THERE are some Things new in my *Synops. Av. & Piscium*. By new, I mean such as were not comprehended in Mr. *Willughby's Works*. Those are *Hernandez's Mexican Birds*. 2. Some Names and Descriptions of *Birds* out of *Nieubhoff*. 3. *Frid. Martens's Spitzberg Birds and Fishes*. 4. *Sir Robert Sibbald's Whales*. 5. *Dr. Sloane's Jamaica Birds and Fishes*. 6. *Your Birds and Fishes* taken out of the *Leyden Catalogue*: And lastly some few Things out of *Du Tertre*. Those *Birds of Hernandez* being shortly described, and no Figures added, are very puzzling and confounding: A little to illustrate them, and make them easier to be compared with the Descriptions of other Authors, I have reduced them to a kind of Method according to their Bigness.

2. I will not confidently affirm that there are in this Island any Topical Plants so peculiar to one Place, or Spot of Ground, as not to be found in any other. Some Species, which for a long Time I thought to be such, I afterward found my self mistaken in; for Example, *Eryngium vulgare S. campestre*, *Rhamnus secundus Clusii*, and *Pisum Maritimum Aldeburgense*; to which I might add the *Box-tree*: Yet I am verily persuaded there are some such; as to name no more, *Periclymenum parvum Prutenicum Clus.* and *Calceolus Mariæ*. But that there are some peculiar to a County, and that few Counties of any Extent want such, is my present Opinion and Assertion. However, it is enough for my Purpose, and I pretend to no more, than that there are some, for ought hath yet

yet been discovered peculiar to each County. Nay in these Catalogues [added to *Camden's Brit.*] I pretend not to so much, but have entitl'd them only *Catalogues of more rare Plants growing in this or that County*, not affirming them to be peculiar. You must needs grant, that different Soils and different Climates, and tempers of Air, produce different Species; and consequently the Mountainous and *Northern* Parts of this Island differ from the more level, depressed and *Southern*, not to confine our selves to Counties. But enough of this.

Mr. Paschall to Mr. Ray.

S I R,

I Was lately thinking that this Globe in several parts, and times, and states of it, sends forth various *Effluvia*, Sulphureous, Nitrous, Aqueous, &c. in greater abundance, one or other, or Compositions of them, as Causes concur.

I have suspected, that in this unusual Constitution of the Air we are now in, the sulphureous Steams have abounded, partly from beautiful and promising blowing of Fruit-trees, and from the warmth of the Season, and from the frequent Lightnings we have. Last Night I noted in my own Orchard, in this my low Countrey Habitation, what confirms me in it, walking between two fair Codling Hedges I noted something to fall white upon my Hat: It felt clammy, and tasted sweet; I took it off with my Knife, the white Grains ran into a clear Liquor, and in a short time I was able to get together a small quantity into a little Gally-pot that I keep; upon shaking of any Bough this would fall as a Mist doth. All Day in these Hedges was a Noise as of a swarm of Bees. We
saw

saw it lying upon the Leaves as well as Blossoms. I have noted *Honey Dew*s, which do much hurt to our Corn; but never thus early, nor in this Form of *Manna*. Taking some on a broad smooth Leather, I observ'd they did not dissolve presently, but run along as small round Seeds, upon the motion of the Leather.

Chedsey, Apr. 24. 1694.

Mr. Paschall to Mr. Ray.

S I R,

I Was engag'd in a Journey when your last came, and observ'd in both going out and coming home, that taking in both the *rising Senaries* I was much less weary than I use to be if I travel in a *falling Senary*. This holds with me generally, as I have many times noted. I also noted, as I have done frequently, that in the *Ebbs*, the Mid-heaven about the *Zenith* was clearer, and more free from Clouds in a cloudy, and *Nebulæ* in a nebulous Season, than the Parts nearer the Horizon; and that it was *vice versa* in the *Tides*.

I know one who commonly finds that if he take but a very gentle *Purgative* in a *rising Senary*, or the former part of a *Tide*, it works not till the *ebbing Senary* begins, and then doth very kindly. And he takes it for a Rule, that in *Tides* the healthy are best, and the sickly worst; but in *Ebbs* the contrary holds. He also thinks, upon several tryals, that the Surface of a wholesome Earth opened in a *Tyde*, emits Steams that are more salutary and healing, and corroborating than the same doth send forth in *Ebbs*. But I stop a rambling Pen, and ever rest, &c.

Chedsey, May 25. 1694.

P. S. The miraculous Cure upon the *French Maid* was in the midst of a *Tyding Senary*; the Power that effected it made use of a heighten'd Imagination, and a vigorous Season.

Of these *Senaries* see Mr. *Paschall's* Opinion in *Philos. Transact.* N^o 202. W. D.

There are divers Letters of Mr. *Lhwyd's* to Mr. *Ray*, relating to this unusual *Fire* here mentioned; which I omit publishing by reason there is an Account of Mr. *Lhwyd's* and Mr. *Jones's* in *Phil. Transact.* N^o 208, 213. but this Letter having some of Mr. *Ldwyd's* Thoughts about it, not there publish'd, I thought it convenient to entertain the Reader with it. W. D.

Mr. Lhwyd to Mr. Ray.

Honoured Sir,

Oxford, May 27, 1694.

Your last was of *January* 22. since which time I have not been able (tho' I have endeavour'd it very much by sending *Queries* to the Countrey) to give you any farther and more accurate Account of that prodigious *Fire* I then alarm'd you with. I understand only in general, that it lasted at least three or four Months; nay some add that it still continues, tho' not in the same Place; but appears up farther in the Countrey, and that it has been also commonly seen on the Sea Coast of *Caernarvonshire*. The reason that induced me at the beginning to think of the *Locusts*, was only a random Guess, that so strange and unheard of Effects must proceed from some Cause no less unusual: For if ever our Sea or Land had been capable of their own Nature to produce such a Meteor, I should expect to find it recorded, that at one time or other,

in the Revolutions of some Centuries, such a thing had happen'd.

You have probably seen, e'er this, the *Phil. Trans.* of *Febr.* where there's all the Account I could give of the Locusts, but no Figure of the Animal; tho' I sent it up, and Mr. *Waller* promis'd to have it Engraven. I have been inform'd since that many of them have been seen amongst the Sea Weeds at *Lbyn* in *Cacrnarvonshire*, and also in the *Severn Sea* in *Monmouthshire*. 'Twas my Suspicion that the infectious Exhalation of these dead Locusts might kindle, &c. For *Pliny* tells us that even whilst they live, *multa contactu adurunt*. There has been, and still continues, a great mortality of Cattel, Horses, Sheep and Hogs, about the place where the Fire happen'd; some say Cattel were wont to dye there formerly, others only that 'twas no good thriving or feeding Place for them: But all agree in that it never was Infectious any thing comparably to what has happen'd this Year. These *Locusts*, it seems, came also last Year into *Germany*; and *Job Ludolphus* (as you find by the inclos'd) designs a particular Treatise of them; wherein he'll maintain that the *Quails*, wherewith the *Children of Israel* were fed in the *Wildernefs*, were no other than these Creatures.

Mr. Paschal to Mr. Ray.

S I R,

I Lately receiv'd from a worthy Friend in *Oxford*, in an eminent Station there, *Proposals for a Method of providing for the Widows and Children of poor Clergymen*; which took so in one County, that in a short time, by the voluntary Subscriptions of Clergymen, there was rais'd near an 100*l.* per *Annum* for
five

five Years as an Essay, with expectation of much more there. When a tryal was made here to see how it would take in the Countrey, there was a beginning made with great alacrity; and when it was recommended to our *Bishop*, and the *Dean* and *Residentiaries* present in *Wells*, it receiv'd Encouragement there from every one of them: And Dr. *Jurden*, your Neighbour, writes me word that he will advise with the *Bishop of London*, and the *Arch-deacons*, and chief of the Clergy in *Essex* about it, wishing his Endeavours may have good Success. The thing is particularly recommended to me by this Consideration, that this well settled may be as a Chancel into which particular and private Charities may be deriv'd, in which they may run to the named good Purposes, and to still higher and better, if under the divine Blessing it shall go on and prosper. If you meet any thing for or against it, you will oblige me by the Communication.

Ch. Aug. 20. 1694.

Mr. Ray to Dr. Robinson.

S I R,

Dec. 20.—94.

There are three particulars which I must beg Information from you, concerning: Whether there be sufficient Authority, that the *Blood of a living Hedge-hog is cold to the touch?* Which Dr. *Lister* takes for granted: I never read of any but *Segerus* who did affirm it, and do much doubt of the Truth of it. 2. Whether the *Blood flowing from the Artery of a living Fish, between the Heart and the Gills, be of a florid Red*, like the arterial Blood of 4^{peds}, as Dr. *Lister* affirms? 3. Whether the *venal Blood of an Animal may by any artificial compression or constriction*

on be changed into the Colour of the arterial? To which I shall add a Question more, viz. Whether in the Chicken before exclusion there be any *Foramen ovale*, or arterial Chanel for the Passage of the Blood, while the Lungs lie vacant.

Dr. Robinson's Answer to Mr. Ray.

S I R,

London, Decemb. 20—94.

SOME of your Queries I can Answer, as that relating to the *Blood of a Hedge-hog*, which I found to be warm to the touch when I was at Mr. *Clutterbuck's* in *Essex*; where I was particularly curious to examine that particular, but I would not be quoted against Dr. *Lister*, lest he should take it ill.

I never observ'd the arterial *Blood of a Fish*, to be as florid as that of *Quadrupeds*.

I do not think that the venal Blood of Animals can by any artificial compression, or constriction, be changed into the Colour of the Arterial; I am sure that the Air immediately changes its colour and consistence upon Phlebotomy.

I cannot Answer that of the Chicken before exclusion, I wonder *Aquapendente*, *Harvey*, *Malpighi* and others have not clear'd it.

Upon reading Dr. *Lister's* Assertion of the *Blood of the Hedge-hog being cold*, I tried the Experiment effectually with a nice *Thermometer*, upon Mar. 17. 1714³. and found not only that *Hedge-hogs* (for I made use of more than one) are warm, like other Animals, but that their Blood running from an Artery upon the *Thermometer*, raised the Spirits therein considerably, as it doth when the Blood of other Animals is, in the same Quantity, emitted from an Artery on the *Thermometer*.

W. D.

Mr.

Mr. Burrell to Mr. Ray.

S I R,

9 Jan. 1694.

I Have, Sir, in some of my melancholick Hours, been diverted by the Tract I have of yours, and particularly your *Synopsis Animalium*, &c. wherein I observe your Opinion settled against *Æquivocal Generations*, and fol. 15. confirm'd by many Arguments, and great Authorities: Yet if I had leave I would ask if the Species of *Worms bred in humane Bodies*, or those of *Brutes*, are at any time observ'd to be generated elsewhere? For I should think it would be hard to say their Eggs are convey'd out of one Man, or one Horse into another: And the *Phthiriasis*, which I suppose is where Worms are bred in the Flesh, and which happens to one single Man in a Nation, and that perhaps once in an hundred Years, will be more difficultly answer'd, where that Species of *Worms* or *Lice*, do all that time conceal and preserve themselves, and at length light upon this single Person. But, Sir, 'tis said by some Body, *Sequimur non quâ veritas sed quâ Ratio trahit*; whether that be applicable here or not, I pretend not to determine. I observe likewise fol. 300, you say, *Quod non verisimile videtur quodvis animal à naturâ ita factum esse, ut cibi deglutiti partem aliquam vomitu semper aut etiam frequenter rejicere debeat*. I should here enquire whether the *Castings* of *Hawks*, which you know constantly throw up lumps of Flix, or Feathers, or Down, &c. (the wild as well as the reclaimed) bring any of the Food up with 'em. In fol. 309. I presume there is an Error in the Print, *i. e.* *Hirundines* for *Hirudines*. You see, Sir, how confidently, not to say impudently, I trouble you with what I my self can't believe will deserve
your

your considering; but however, this shews you I read what you give (tho' not with that Advantage which a Man of a wiser Head would do;) and 'tis an Evidence likewise, that I rely very much upon your Candor and Friendship to forgive such Impertinencies.

Mr. Lhwyd to Mr. Ray.

Dear Sir,

Oxford, Aug. 28—95.

THE first of your Queries was, *Whether the impressions be all of Leaves, or parts of Leaves?* To which I Answer, That the Stone wherein these mineral Leaves are exhibited, is generally so brittle, that when we endeavour to split it, to get out a Plant, it breaks also transversly; so that for one whole *Fern-branch* we find, we see twenty broken ones, but for single Leaves they are very common. Moreover, those Stones are broken in such small pieces, by the Workmen in the Pit, that we find few lumps big enough for whole Plants; and indeed if they contain'd whole ones, it seems impossible so to split them as an entire Plant should be exposed to view. Howbeit it has not been my Fortune hitherto to meet with any other parts of Plants than either single Leaves or Branches: Whether there be any Roots or Flowers to be met with, I shall endeavour (God willing) to be inform'd hereafter. Your other Questions are, *Whether they are found smooth or crumpled, and whether we meet with the impressions of each side of a Leaf?* To which I Answer, They are always smooth and fair, and that I have seen both sides of Leaves. Nay, lately (since the Date of my last) I have seen both sides of the same numerical Leaf; so that I can now confirm that Observation of

of Dr. Woodward's, which I mention'd in that Letter. I have sent you here a Figure of one these *Cole Plants*, from which, and those in *Camden*, you may make some Estimate of the rest. I found it at a *Cole-Pit* in the *Forest of Dean*, together with several others. As 1st, *Hart's Tongue*. 2^{dly}, A kind of *Trichomanes*. 3^{dly}, *Lonchitis aspera*, call'd by the Workmen *Vox Wearn*, i.e. Fox Fern. 4^{thly}, A kind of *Equisetum*, which they call *Cat's Tail*. 5^{thly}, A small *Gallium*, or *Mistletoe*, with some others which I know not whither to refer. This seems to resemble partly the *Osmund Royal*, but to me the Leaves are too small, too thick set, and round pointed; but I leave you to match it, who are best able.



Mr.

Mr. Lhwyd to Mr. Ray.

Honoured S I R,

Oxford, Sept. 12—95.

I Receiv'd your Letter of the fourth; and that you may have a truer Idea of these *Subterraneous Plants*, than I can possibly give you by Correspondence; I have sent this Day by the Carrier, a small Box of them, directed for you to be left with Mr. *Smith*. I had brought a great Clod of them about half a Year since, from the *Forest of Dean*, and had bury'd it in the Ground here in a moist place, in hopes 'twould keep the better, the Figures being very apt to disappear after some Months keeping. This, at the taking of it up, crumbl'd in pieces; however, I have sent it you as it is, and hope it may serve to give you as clear a Notion of the state of these *Fossil Leaves*, as if you were your self at the Cole-pits. I have also added those three Specimens I have figur'd in *Camden*, tho' one of them (I mean that which I suppose to be an undescrib'd Plant;) I was willing to venture only the one half, not knowing whether I may ever meet with the like again. These three are much fairer than those we have from *Glocestershire* and *Somerset*, and lodged in firmer Stone. When you have view'd them sufficiently, be pleas'd to take what you like out of the *Glocestershire* Parcel, and return the rest to me at your leisure. I heartily wish you may be able to satisfy your self upon sight of them, whether they are original Productions, or the Remains of once real Plants: For I must confess that at present I cannot acquiesce in the Opinion of their having been once mere Plants growing on the surface of the Earth. I have in my Custody a piece of *native Silver*, lodg'd in *Spar*, brought four Years since out of the *West Indies*; whereof

whereof some part appears out of the Stone, in the form of small spiral or twisted *Capreoli*; and another part is a thin Plate, having such a Superficies on each side, as if it had receiv'd an impressiion from a piece of fine Cloth. Now seeing that *Fossils* do naturally shoot into these Forms, may we not reasonably suspect they might also put on the shapes of Leaves and Shells? I have likewise several times seen somewhat like the Form of a piece of *fine Linen in Flint*, which seems to require no less Admiration than these Plants; tho' we are the more affected with them, because we find the same natural things in the Bowels of the Earth as we knew before in the Surface. However I am almost fully convinced (and have been so for several Years,) that many of those *Vertebræ* and *Shells* which I have met with, are the Spoils of once living Animals; my chiefest reason for which, is, because many of the *Vertebræ* and other *Bones* are of a mere bony Substance; and several Shells which we meet with, are scarce distinguishable in consistence from the same Species on the Sea Shores.

Mr. Ray to Sir Hans Sloane.

S I R,

Black Notley, Aug. 15th—96.

AS for the *Method of Capillaries* which I proposed in my Letter to *Rivinus*, I have not Skill enough in that kind of Plants, as to make use of it, and so must be constrained to adhere to my old Method, a little altered: For whereas I did suppose that no *Capillaries* were properly *Cauliferous*, but that their whole Superficies did consist of mere Leaves; I am now convinced of the contrary, and therefore intend not to meddle with it any more, but to divide those Plants, whether *Cauliferous* or not *Cauliferous*, according

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ding

ding to their Leaves, into such as have a simple Leaf, which I make to be either whole or laciniated, and such as have a compound Leaf. And these into such whose Leaves are compounded of, 1. *Single Leaves*, or *Pinnulæ*. 2. *Surculi pinnati*, or *decomposita*. 3. *Ramastri*, divided into *surculi* and *pinnae*; which Leaves *Bauhine* calls *Ramose*. But to render things clear, I take it to be needful to define a compound Leaf, which I shall do thus. *A part of a Plant which is made up of Pinnulæ, Surculi, or Ramastri, connected on each side to a middle Rib, growing gradually shorter and shorter toward the top of the middle Rib, which also terminates in a Leaf, the Foot-stalk and middle Rib having its supine Superficies different from its prone, viz. either flat or chanel'd.* Thus defining a compound Leaf, I exclude several sorts of compound or pinnate leaved Plants from being *Phyllitides* or *Hemionitides*, &c.

Dr. Vaughan having given an Account of the fatal consequences of eight young Lads eating of *Hemlock water Dropwort* (publish'd in *Phil. Trans.* N^o 238.) proceeds thus.

W. D.

Dr. Vaughan and Dr. Wood to Mr. Ray.

S I R,

Glennell, August 26, 1696.

AND now, Sir, I shall take the freedom to press you to favour the learned World with the *Icons of the Plants described in your History*, which would render it the most compleat Work of the sort the whole World affords; 'tis a Work which you in your *Historia Plantarum* express an inclinableness to, and which I am heartily sorry you have not met with due Encouragement to perform. Sir, I need not lay before you the great Difficulties which the lovers of *Botanie* are forced to encounter, by reason of the want of

of this most desirable Work; nor urge you how agreeable it would be to the *Botanic* World, but especially to your curious Countreymen; neither need I tell you, what without the least suspicion of Flattery, I justly may, that of all Men that ever were in *England*, you are without dispute allow'd to be the most fit to perform such a Work. Pray therefore, Sir, think on some Expedient, by which we may be enabled to reprint your History, and render it compleat by the addition of the Cuts, and another review, which will make it much more correct. I question not but that I can procure at least eighteen Subscriptions in this poor Kingdom, for the promotion of so advantageous a Work: But if you find that this will not quit Cost, if you printed only the small *Icons* of the Plants, and their Names, in *Quarto* or *Octavo*, I am confident you would highly oblige all that have the least Curiosity to promote their knowledge in *Botanics*. Sir, Dr. Wood, Dr. Mitchell and I have resolv'd to be as curious as our leifures will permit, in making a Collection of what Plants this Kingdom affords: We have begun this Summer at *Wexford*, where we casually met to drink the medicinal Waters, and in the Month we staid there we made up a Catalogue of above 280 Plants, the which we have, and design to augment, as opportunity offers to any of us. Sir, I hope you will pardon this trouble, &c.

S I R,

Kilkenny, Aug. ult. 1696.

IN your *Synopsis* you question whether the *Irish* in drying their *Dullysk*, do not add some *Alcaline* Salt? I have enquired, and can assure you that they add no kind of Salt, nor indeed any thing else. They only pull it off the Rocks whereon it grows, and spread it on the Grass in the warm Sun to dry, or rather on a lousy green Mantle (as my Friend adds, who gave me this Relation, and has seen much of it dried and eaten in *Kerry*, and elsewhere) while drying: It

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sometimes appears frosted over with a Salt, which for the most part falls off again in handling it, and is probably nothing else but the Particles of Salt remaining after the Sun has exhal'd the Sea Water that stuck to it. When thoroughly dry, 'tis fit for use, and may be kept seven Years, if hung up in a Net or the like. They eat it at all times when no other Food is to be had, but chiefly in the Morning, and esteem it good against Worms and the Scurvy, and to cause a sweet Breath. And now, Sir, if it were necessary, I could muster up several Arguments to press you to what my self, and Friend, and College has urg'd about the *Icons*, but you know well the necessity and usefulness of such a Work: I would therefore at present only hint one thing, that 'tis pity that so beneficial a Work is not promoted by publick Authority; and what if a Motion were made, and effectually back'd, next Session of Parliament, that it be carry'd on at a publick Charge? If it be objected, that our Treasure is exhausted by a War, &c. I would answer, that (not to mention the hopes we have of a general Peace) the *French* King, notwithstanding the tedious and expensive War he is engag'd in, thinks it yet fit to encourage all Arts and Sciences. *Fas est & ab hoste doceri.*

Sir Hans Sloane to Mr. Ray.

S I R,

London, Sept. 11. 1696.

I Have receiv'd, after much search, three sorts of *Beans* from the *North West Islands of Scotland*, which are thrown up by the Sea from the *North West* great Ocean, and gather'd in plenty on those *North West* Shores, and are such as grow in *Jamaica*, viz. the *Bean* call'd there *Cocoons*, that call'd *Horse Eye Bean*,

Bean, and the *Ash* colour'd *Nickar*, or *Bonduch*. You will find them all in my Catalogue, under those vulgar Names, by the *Index*; there is also a fourth sent me thence, which is, I think, the *Avellana quadrifida*. *J. B.* Where its natural Place is I know not; but the others you may find their Countries by the Authors which speak of them, for they must come to *Scotland* by the currents of the Sea. I have heard of some thrown up in *England*, and should be glad to have your thoughts of this matter. The small *Coral* in *Falmouth Road* you may see I found in *England*, and had it from the *Magellan Streights*. I beg your pardon for this trouble.

Mr. Ray's Answer to Sir Hans Sloane.

S I R,

B. N. 7^r 17—96.

WHAT you write concerning the *Fruits* gather'd in plenty on the Shores of the *North West Islands of Scotland*, is very strange. I have formerly read something of it in the *Philosophical Transactions*. I think, but gave no great heed to it; but now I see there was Truth in it. It is very unlikely to me that they should be brought so far by any Current of the Sea: I should rather think they came from Vessels cast away by Shipwrack near those Parts. But it is a thing very well deserves to be farther and more diligently enquired into, sith the matter of Fact is certain.

Mr.

Dr. Conner to Mr. Ray.

S I R,

London, Bow-street, 9^r—96.

DR. *Sloane* has been pleas'd to give me your ingenious and learned *Dissertation about Respiration*, to peruse it, which I have done with a great deal of Satisfaction and Improvement, finding in it a great many solid Observations concerning the Respiration of *Fishes, Insects*, and other Animals. I find that you think that the Substance or Body of the Air passes from the *Bronchia* and Lungs into the substance of the Blood, and that, *Pabuli instar*, it foment and maintains the vital Flame which you suppose to be in the sulphureous Parts of the Blood, as the Air foment the common Flame of a Candle, and that the Nitre has nothing to do in this effect.

You and I, Sir, agree in this, that the body of the Air gets into the mass of Blood, and that its Nitre there is of no use or energy. We agree, likewise, that the use of Respiration is to rarify and vivify the Blood; we only differ in the manner how this rarification is perform'd. I know that there are very eminent Men which are of Opinion that the oily Parts of the Blood do constantly entertain not only a considerable Heat, but likewise a true Flame in the whole Mass: You add to them that the Air comes to foment it. I was much of this Opinion my self not long ago, but you will be pleas'd to let me (with submission to your Mind) to propose to you, in order to be informed, the Difficulties I met with in this Opinion. I find that those who eat most of Cheese, Butter, fat Meat, and other sulphureous Aliments, and those that are very corpulent and fat themselves, have

have generally leffer heat in their Blood, and a flower Circulation and Pulse, and are less subject to Fevers, than Persons that are dry and lean, I mean the bilious. I find that in most Chymical Fermentations Sulphur is far from encreasing motion and heat, it rather retards it by involving the saline Principles, which are the true cause of fermentation and heat. I consider, likewise, that if there was any thing of the nature of a Flame in the Blood, it would only be in the Lungs where it meets the Air; but when once it would pass from the Lungs into the Heart, and into the narrow passages of the Veins and Arteries, it could no more flame than a lighted Candle pass'd into the deep mouth of a hollow Candlestick. Besides, I cannot believe that the Air is an aliment to our common Flame, no more than by its pressure and elasticity in keeping and crouding together into a Vertex the igneous Particles, as I have hinted in the Treatise *De Antris Lethiferis*. For I cannot conceive how the Air that comes to the mouth of an Oven can serve for a *Pabulum* to the Flame which is in the bottom of the Oven, for it cannot come near it; so that I am apt to believe that the Candle goes out in the air Pump, only because the Air being exhausted, there remains nothing to keep together the flying parts of the Candle, and so they soon vanish away; not because there wants a *pabulum* of Air or Nitre, since the sulphureous parts of the Candle it self are *pabulum* enough.

From these and several other Reasons I have concluded that the intestine Motion of the Blood is a true fermentation arising from the struggling of its saline Parts, and mitigated by its sulphureous ones, like the fermentation of Beer, Wine, or Syder, though in a higher degree. This fermentation causes heat in the Blood, this heat expands and rarifies the Air that comes in by respiration: The expanded Air expands reciprocally the Blood, and makes it frothy, thin and florid:

florid: So that Respiration is indispensably necessary for Life, to be a constant cause of the attenuation and subtilization of the Blood; though the sulphur of the Blood is not supposed by me to be the cause of this Heat, yet it is very necessary to bridle and to keep together the saline Principles, and to hinder them from evaporating too soon till new ones are supplied by the Chyle; so by its pliable and limber oblong Particles it wraps up and keeps close together the volatile Principles of the Blood, that otherwise might fly away. This is, Sir, in few Words, what I think of this Subject, which I submit entirely to your better Judgment, contending for nothing else but Truth.

Dr. Vaughan and Dr. Wood to Mr. Ray.

S I R,

Clonmell, April 24. 1697.

I Shall add a few Observations concerning the *Tithymalus Hibernicus Ascyron supinum villosum palustre*, &c. I order'd an *Irish* Chirurgeon to make a decoction of the Root and a few Leaves of the *Tithymalus Hibernicus*, but its Exhalations were so very Acrimonious, that he holding his Head two or three times over the decoction, to see how it proceeded, his Face and Hands were blister'd most sadly. Some of the *Irish* use this Root boiled in Milk, as a Cathartick, whose direful Effect there was a melancholick Instance of, about three Years ago, eight Miles hence. A brisk young *Irishman*, who complaining of a dull Pain in his left Side, which, I suppose, was an inveterate obstruction of his Spleen; a Countrey-man Quack of his gave him a Dose of the above Decoction, which occasion'd a violent Hypercatharsis, dreadful Convulsions, and Death before ten a Clock
that

that Night ; but I believe that an Extract might be prepar'd with the addition of *Spiritus Vitrioli*, which might be of excellent use in chronick Distempers of robust Bodies. I was by your *Historia plantarum* induced to make an Extract of *Trifolium paludosum*, which I have found an excellent Remedy in vomitu, imbecillitate ventriculi, cruditatibus acidis, Scorbuto, Chlorosi, and question not but that it is an extraordinary universal deobstruent: I have used several Pounds of it this last Year, and shall make greater use of it for the future. I have also used it as an *Injection* (in sordid Ulcers) dissolved in Fountain Water, and think it has as good mundifying effects, as Tincture of Myrrh and Aloes; but then you must dissolve as much of the Extract as the Water will well contain. I much wonder that the *Ascyron tomentosum palustre* has not been more taken notice of in Physick; for I look upon it to be one of the best Balsamick astringent Plants we have, the native Irish call it *Birin Yarragh*, which signifies *Herba dysenterica*, and use it in that Distemper with good success, and I have used it boiled in Milk with very good success, *Præmissis universalibus*, in *Fluore albo*. 'Tis doubtless an excellent Vulnerary, and effectual in all Fluxes beyond any Herb I know.

Worthy Sir,

Kilkenny, April 28. 1697.

AS to *Insects* I am sorry I have nothing by me worth communicating, I had formerly made several Observations on these *Animalcula*, but being forced in the late Troubles for England; I left most of what I was worth in *Limerick*, which Place holding out longer than any other Part of the Kingdom, I there lost most of my Books, and what I esteem more, my Papers and Manuscripts. At present I have only to say, that I am apt to think there are few Plants, but if narrowly look'd into would be found to produce some kind or other of Insect, nor by way of e-

quivocal Generation, which Notion is now as universally as deservedly exploded; but by becoming fit *Matrices* to cherish and mature Eggs deposited in or on them. I have lately observed many Eggs in the common *Rush*, *juncus lævis vulg.* but I know not yet what Animal they produce. One sort are little transparent Bodies, in Shape somewhat like a Pear or a Retort, lying within the Skin, upon or in the *Medulla*, just against a brownish spot on the outside of the *Rush*, which is apparently the cicatrix of the Wound made by the *Fly* when she put her Eggs there. Another kind, I observe, which are much larger, and not so transparent, of a long Oval, or rather cylindrical Form; six, eight, or more of these lie commonly together across the *Rush*, parallel to each other, like the teeth of a Comb, and are as long as the breadth of the *Rush*. These, Sir, are only hints to be farther improv'd by you, who being so conversant with Plants, and designing a Treatise of *Insects*, may have opportunity of examining them more accurately. I can see no reason in the fancy of some Men who would deduce *all Distempers from Insects*, yet I am persuaded they have more share in the Production of some, than many will imagine. In some sorts of *Scabs* and *Itch* I have seen very small white Animals taken out with a Needle, and to have been living, and very nimble in their motion. These often make visible Passages under the Skin from Scab to Scab, like a Mole under the Earth. Add hereunto Animals taken out of the *Gums*, and other Parts, mention'd in the Philosoph. Transact. I wish a good Account could be given of some Animals produc'd with of others, as the *Lumbrici lati* in Men, and of *Toads* found living in the middle of massy Stones, &c.

Mr. Doody to Mr. Ray.

S I R,

DR. *Woodward* has shewed me *Slates*, wherein there were not only *Shades of Plants*, as in the *Dendroides*, but the *real Body*, and become very hard, by imbibing in these stony Particles; in one Side of the *Slate* a Cavity with the Impress of the Leaf, and on the other Side it may be seen prominent, and in both every little Lineament so exact, that I could not doubt that they had once grown. I have not seen them very lately, but I intend e're long; and then I shall be able to give you a farther Account.

Tentzelius to Mr. Ray.

V I R C E L E B E R R I M E,

Biennium est, ex quo controversia agitur inter me & Collegium Medicum Gethanum de prægrandibus ossibus terræ effossis, quæ ego ab *Elephanto*, Medici autem purè fossile esse contendunt. Epistolam, quam *Magliabechio* tunc inscripsi, primo statim mense ad illustrem Societatem Regiam misi, unà cum ossium fragmentis, illiusque judicio cuncta subjeci. Verùm non pervenisse ad manus vestras, ex silentio colligo, cùm satis ex adverso mihi constet, quâ humanitate respondere soleatis Germanis, curiosa vobis dijudicanda offerentibus. Opto igitur, ut hic fasciculus felicius sit, quem curandum susceperunt fratres *Janssonio-Waesbergij*, Bibliopolæ *Amstelodamenses*, cum quibus his nundinis, celeberrimum *Ludolfum* visitans, noti-

Q q 2

tiam

tiam contraxi; iidemque responsum, si quo beare me volueris, huc transmittent. Enimvero ad te scribendi audaciam meam benignè interpretaberis, quæ non solùm ex *Synopsi Quadrupedum TUA* hinc inde in litteris meis allegata, oritur, verùm etiam ex *Rivini Lipsiensis* aliorumq; exemplo, qui tuo consilio operaque feliciter usi sunt. Quare spe sustentor optimâ, fore, ut eandem mihi gratiam præstes, & epistolam meam Medicorumque Apologiam inter se & cum fragmentis ossium additis conferas; quorum bina ex dentibus maximis proëminentibus sumta tubulos striasque manifestissimè præbent conspiciendas; tertium ex cranio cùm alias ob causas, tum propterea notabile est, quod continet particulas margæ crassiores ex fluore remanentes & substantiam ossis in lapidem convertentes, eo modo, quem docuit *Boetig* in epistolâ meâ laudatus. Huc ergo tendit votorum meorum, summa, ut vel tuo solùm, vel Illustrissimæ etiam Societatis nomine de totâ controversiâ liberrimè sententiam feras, & quamprimum licuerit, ad me transcribas, cum debito vobis elogio libello meo inserendam, quem *Medicorum simul Italarum, Gallorum & Germanorum* judiciis exornabo. Denique si vivit adhuc *Moulinus*, Anatomix Elephantinæ auctor, nihil gratum magis acceptumq; mihi foret, quàm ut illi quoque omnia, quæ mitto exhibeantur, eum potissimum in finem, ut se defendat ab ἐγκλήματι adversariorum meorum, quasi perperam bestix applicuerit terminos Anatomicos soli homini proprios. Sed is indubiè habet fundamenta, quæ censoribus illis opponat. Vale & certus esto me nihil prætermisurum officiorum tibi præstandorum, quod in meâ quidem potestate situm est. *Vale iterum Francofurti ad Arvenum* Cal. Maii CIO DCIIC.

If the Reader hath a mind to it, he may find *Tentzelius's* Account of those subterraneous *Bones* in *Philos. Transact.* N^o. 234. *W. D.*

In Mr. T. Steward's Letter from Debenham in Suffolk to Mr. Ray, prid. Calend. Dec. 1698.

HAVING related how grievously his Wife was afflicted in the Small-Pox with a sore Throat, he saith this Medicine did her great Service, viz. *R. Chelidon. major. Manip. parvum modicè tusum. In Vini albi semipintâ decoq. ad dimidii consumptionem. Cap. cochl. 2 vel 3 quâlibet horâ. Medicamentum hoc simplex & facile parabile (utut vile videatur) efficacissimum esse ad exulcerationem prædictam comprobavi. Multos sanè morti proximos sanavit; Pustulas ita dissolvit, ut cibum & potum sine ullo cruciatu æger deglutiât, &c.*

Mr. Lhwyd to Mr. Ray.

Dear SIR,

Dôl Gelbey, Jan. 21. — 9⁸.

I Know not whether I ever mention'd to you (tho' you have probably frequently observ'd it your self) in what Manner the *Bats* are lodg'd in the *Caves* during *Winter*. The *Caves* of this Countrey (to mention that by the By) are always (I speak of the Inland Caves) in Lime-stone; and in such Places only are all our *Subterraneous Brooks*, which in *Wales* are no great Rarity. In these Caves the *Bats* chuse the driest Apartments, where planting their Talons to the Roof, they cover their Bodies with their Wings; and so hanging perpendicularly in great Numbers, (but so as they touch not each other) they sleep for some Months.

Sir

Sir Hans Sloane to Mr. Ray.

S I R,

London, March 9. 169⁸.

THIS Day a large *Tyger* was baited by 3 *Bear-Dogs*, one after another. The first Dog he kill'd; the second was a Match for him, and sometimes he had the better, sometimes the Dog; but the Battle was at last drawn, and neither car'd for engaging any farther. The third Dog had likewise sometimes the better, and sometimes the worse of it; and it came also to a drawn Battle. But the wisest Dog of all was a fourth, that neither by fair Means, nor foul, could be brought to go within reach of the *Tyger*, who was chain'd in the Middle of a large Cock-pit. The Owner got about 300 *l.* for this Show, the best Seats being a Guinea, and the worst 5 *s.* The *Tyger* used his Paws very much to cuff his Adversaries with, and sometimes would exert his Claws, but not often; using his Jaws most, and aiming at under, or upper Sides of the Neck, where Wounds are dangerous. He had a Fowl given him alive; which, by means of his Feet and Mouth, he very artfully first pluck'd, and then eat; the Feathers, such as got into his Mouth, being troublesome. The Remainders of his Drink, in which he has lapp'd, is said by his Keeper to kill Dogs, and other Animals, that drink after him, being by his Fome made poisonous and ropy. I hope you will pardon this tedious Narration, because I am apt to think 'tis very rare that such a Battle happens, or such a fine *Tyger* is seen here. I am, &c.

Mr.

Mr. Ray's Answer.

S I R,

March 14. --9⁸.

I Thank you for your Account of the *Tyger's* Combat with the Dogs. That Creature was very rarely seen at *Rome* it self. I wonder how they got it: Surely it is no true *Asiatick*, but *American Tyger*.

Sir Hans Sloane to Mr. Ray.

S I R,

London, Nov. 25. 1699.

I Saw this Day the strong *Kentish Man*; he lifted up about 2000 *l.* Weight, broke a Rope that would lift up about 3000 *l.* and kept himself from being pulled out of his Place by a very strong Dray-Horse. He has nothing appears outwardly to give him such Force.

Dr. Wood to Mr. Ray.

Honoured S I R,

Kilkenny, July 18. 1700.

P *Runella* is a Plant esteem'd, by all Authors and Practitioners that I have met with, to be a *Vulnerary*, and us'd only in that Case, and the Distemper whence it takes its Name, wherein it is effectual on the same Account: But the Natives of this Country, who pretend to great Skill in Herbs, give it frequently (boil'd in Posset-Drink) in all Sorts of common continual Fevers, I mean all but malignant ones, and expect great Matters from it. And some give it also in intermitting Fevers: But I have not been able to judge whether it be so effectual as they pretend, or no, because commonly other Medicines are also given. I am credibly inform'd that 'tis us'd in the same Case in several Parts of *Wales*, where they call it by the

the same Name with the *Irish, Cannavan Beg.* I would gladly be inform'd whether you have known it made use of to this Purpose, and with what Success.

An ingenious Friend of mine frequently troubled with the *Gout*, has sometimes found Ease by applying *Bardana* to the Part affected. Being lately afflicted with this Distemper in his Foot, he was desirous to make use of the same Remedy; but by a Mistake he applied a Leaf of *Petasitis* instead of *Bardana*, and being somewhat short-sighted, did not presently perceive the Mistake, until Morning he was surpriz'd with a speedier Cure than he expected. For whereas the *Bardana* was wont to give him Ease in 3 or 4 Days time, the *Petasitis* had in one Night wonderfully relieved him, insomuch that the Pain and Inflammation were wholly gone, and the Tumor in a great Measure abated. Since that Time he has been very free from this Distemper, but does almost long for another Fit, that he might have the Opportunity of repeating this Experiment. I have not since he gave me this Account had an Opportunity of making use of this Plant in this Case, but question not I soon shall, the *Gout* being of late Years become very common in this Countrey; and if I find it any way successful, you may expect to hear from me.

Father Camel to Mr. Ray.

*Erudite Doctissime ac Colendissime Domine, Domine
Joanne Raye.*

L Iteras tuas *Notleix* in *Essexia* 19 Januarii Anni 1700 ad me datas accepi 18 Septembris ejusdem Anni, in quibus rescribis accepisse plantas illas *Luzonis* quas mittebam. Reliquarum Iconas misi Januario
Anni

Anni 98 : Sed navis à Piratis intercepta fuit, & probabiliter periêre. Misi postea denuo Icones plantarum humilium unâ cum descriptionibus Januario Anni 99. Verùm ob mortem *D. Samuelis Brauwne*, quò devenerint me latet, scripsi *D. Edwardo Bulkleyo Meliaporum* ut ea requireret, ac simul literas tunc pro te expeditas. Miraris me scripsisse *Indigenas Philippinarum* domestica fastidire, & negligere, peregrinis verò inhiare ; sed hoc non fit ob defectum Medicaminum domesticorum, verùm ob cognitionis, ut scribebam, defectum : Et si *Europam Thomas Bartholinus* exoticis non indigere sentit, multò minùs meâ sententiâ opus habet *India Europæis*. *Nucem Vomicam* Off. Fungum appellavi cum *Cæsalpino*, & *Chinensibus*, non tamen pro tali habebam, cum simile semen, (quamvis minus) invenerim Plantæ Volubilis, & postea priùs maceratam diffecuerim, facilè in duas placentulas dispescuerim, & dividuum feminale corculum in eâ invenerim. *Pseudo-Amomum* quorundam, seu *Caryophyllon Plinianum Clusii* suspicabar esse unam *Fagaræ*, verùm paulò post certior factus fui in *Luzone*, & adjacentibus *Fagaram* adolescere utramque. Pro nunc, & cum præsentibus plura de Plantis non mitto, quia rogatus à *D. Doctore Wilhelmo ten Rhyne*, ei omnia, quæ de Plantis adnotata asservabam *Bataviam* misi, qui utrùm ea, vel aliqua ex iis, fortè unâ cum Plantis quas ipse *Javæ* observavit, typis mandare cogitet, ignoro ; certiozem te faciam ubi responsorias nactus fuero à *D. ten Rhyne*. Mitto hâc occasione *D. Jacobo Petiver* (quia te morbis provecæ senectutis molestari confidero) paucula de *Insectis* quibusdam, qui ut spero ea tecum communicavit, plura dabo occasione proximâ. Interim vive diu felix, & annis senectutis placidâ salute comitatis, quàm dulcissimè frui in annos plurimos ut ex animo precatur,

Georgius Josephus Camelus.

Dabam *Manila* 28 Octobris, Anni 1700.

R r

Mr.

Mr. Ray's Answer to Father Camelli.

Reverende Pater, Amice Colendissime

L Iteras tuas novissimas accepi superiori æstate, & post dimidii anni expectationem descriptiones & icones *Stirpium Luzonicarum*: pro quarum magnifico sanè & gratissimo munere me tibi valde obnoxium & obæratum esse lubens agnosco, & plurimas gratias ago. Opportunè admodum advenere: nam *Supplementum Historiæ meæ Botaniciæ* prelo aptatum est, & jamjam imprimi cœptum, cui descriptiones tuas & historias *Luzonicarum* adjiciendas curabo, omnes unà, eodem quo dispositæ sunt ordine, præfixo nomine tuo cum debito elogio, nè si eas distraherem, suisq; locis secundùm methodum nostram Supplemento insererem, opus extenuarem, illud in tot particulas discerpendo, & longiùs à se invicem removendo. Reliquas *Scandentium* & *Arborum* historias, quas adeò generosè aliâ vice te missurum promittis, ut quàm potes celerrimè expedias oro, ut antè opus nostrum integrum absolutum huc appellant, suùmq; in eo locum inveniant. Icones pulcherrimas, & lucem publicam (si ita loqui liceat) videre dignissimas, quæ descriptiones mirificè illustrent, à Typographis & Bibliopolis nostris ob sumptus in Calchographis faciendis, ut impensis suis imprimant ægrè, ut vereor, impetrabo. Conabor tamen (quantum in me est) ut id effectum reddam.

D. Petiver à te efflagitat, ut ramulos *Stirpium* descriptarum & depictarum in Schedis ad nos transmissis, exsiccatos transmittere digneris, ità enim certius judicium de eis fieri posse, conferendo cum Plantis quas ab *Indiis* exsiccatas amici plurimas transmiserunt, an scil. novæ & nondum à se visæ fuerint. Exsiccare autem posse
extensas

extensas cùm noviter decerptæ sunt inter chartas bibulas seu emporeticas reponendo, & subinde antequam putrescant mutando, donec exaruerint.

Valeas, celeberrime vir, Historiæ Botanicæ promovendæ nate, immortalī laude dignissime, & opus in quod tantum temporis studii & laboris impendisti, totam nimirum *Philippinarum* insularum Historiam naturalem, feliciter absolvas, ita precatur.

Mr. J. Morton, Rector of Oxendon in Northamptonshire, to Mr. Ray Nov. 23. 1700.

Amongst the many Requests which are made to you by the learned World, permit me to mention one, that is, *That you would enrich the Publick with the History of the Scripture Plants*; a Work, which, altho' attempted by some, is certainly one of the *Desiderata* still; and all do agree you the fittest Person in the World for it.

Another Letter of Jan. 15. 1700.

WHAT are your Thoughts of the Origine of that Concrete Juice [*Manna*] collected from the Leaves of the *Calabrian Ash*? Is it not an *Exudation*, occasioned by *Insects* opening Orifices in the Leaves with their *Terebellæ*? The *Exudations* of the Leaves of Oaks, Ashes, and other Plants in *England*, I think I can shew are frequently occasioned by these Means. Of which, see Mr. Morton's *Nat. Hist. of Northamptonshire*.

Dr. Preston to Mr. Ray.

S I R,

Since my Arrival in *Scotland* I have been so much diverted by Business, that I have got but little spare Time to mind any thing of Curiosity, (save this last Summer that I made some few Observations on Plants) which has been the Occasion of my long Silence. Besides, I cou'd not perform my Promise in giving you the Synonyme of such Plants as were enter'd in the *Elementa Bot.* under a new Name, and as *Non-descripts*, and yet were old Plants; for I wanted the *Elementa Bot.* And having Advice from *Paris* of his [*Tournefort's*] publishing the *Latin* Edition with all Expedition, made me something remiss; for I knew he would save us that Trouble: Therefore I hope you will excuse my Silence, and I shall recompense it by transmitting to you from time to time such Observations as I had Occasion to make. I do not propose any Order or Method in doing it, but give them you, such as they are, as they come to hand. I confess *Tournefort* in his *Elem. Bot.* hath treated both you and my Countreyman *Morison* very indiscreetly, for which I did reprove him while at *Paris*, and desir'd him to correct that, as well as other things, in the *Latin* Edition, which he promis'd to do; and accordingly I find all along in his Characters he has omitted what he said in the other Edition against you. In this *Latin* Edition he gives a very good Account of the Rise and Progress of *Botany*, and of the several *Writers* thereof, from *Hippocrates's* Time to our Days; among whom *Gesner*, *Cæsalpinus*, and *Fabius Columna*, were the first who layed down any solid and rational

nal Principles of Method, and for constituting the Genders of Plants; and as *Turnefort* says very well, *Instit. Rei Herbariæ. Ea;q; intenebris adhuc jaceret nisi Robertus Morisonus Scotus eam quasi ab herbariis abalienatum renovasset instaurasset & primus ad usus quotidianos adjunxisset.* After him you have been the great Restorer of Method, and Ornament of *Botany* by your several learned Writings. Dr. *Herman*, whose Memory is to be lamented, was a great Promoter and Follower of the same Method, and designed to publish a short Compend of it for the Use of his Scholars, if an untimely Death had not prevented him, as may be seen in the *Flora Batava non edita*. *Rivinus* has a singular Method, and establishes the Character from the Number of *Pétala* in a Flower. Last of all is *Tournefort*, who finding so many learned Men had writ before him, and that he could not propose to make great Advances in following the same Method; therefore, to gain a Name to himself, be-thought on this new Method, of classing the Plants by their *Similitude in Flowers*, and distinguishing them into several Genus's by their *Seeds* and *Seed-Vessels*, not knowing whether the Method would take or not: But it is no more than the other Method inverted; and since he has once published it, he is obliged to maintain and defend it whatever Inconsistencies there may be in it. *Tournefort* indeed is a most indefatigable and nice Observer of Nature; but I do not think that either his Method is to be accounted the best, or only infallible: For it may be made appear, that his *Method* is as liable to Objections, and he as subject to Mistakes, as others. We are certainly obliged to the Writings of those learned Men, and every one of them deserveth just Praises; but I think it may be done without detracting from the Merit of others. I confess I judge it a very difficult Matter to lay down such Principles of *Method* as will comprehend even the Species of Plants already known, and far

far less those that are yet undiscovered, or that will not be subject to change, or admit of Alteration; for I find by the few Observations that I made this Year, that a *Plant* must be viewed in all the Seasons of it before one can venture to give a true and exact Character of it: And it is not one single Observation that is sufficient to constitute the Character of a *Plant*, for that may escape our Sight or Memory at one time, which we may discover at another. Besides a *Plant* appears under several Disguises or Shapes before its Fruit come to Maturity; therefore it must be from repeated Observations in all the Seasons of it, for I have found, that after having viewed a *Plant* with all the Niceness and Exactness imaginable at one Season, yet on a second Review I have been oblig'd to alter my Thoughts; for instance, in the *Herniaria*. Neither is it to be thought that Botany alone is come to that height of Perfection, as to need no Help or Correction, or that it is less capable of Improvement than other Sciences are; for how many new Species have been discover'd of late Years both in *East* and *West-Indies* never known in the World before, and how many lie hid to this Day. Has not Botany made more Advances, and is more improved in our Days by the several learned Men and Writers thereof, than for some Ages past; and I think we owe no less Obligation to the Revivers and Restorers of Method, than to the first Inventor. *Anatomy* is a Science which it's thought might have come to its height of Perfection long ago, by the many and frequent Dissections on human Bodies of learned and curious Men; and yet we find several Things have escaped even the Knife of the most curious Dissectors for some Ages past, and are only discover'd in our Days. So it is as to *Botany*.

Now, Sir, I shall subjoin a few of these Observations that I have had Occasion to make: And first I begin with some of those in the former Queries, where

where Answers were not so distinct or positive, or where I have since found my self to have been in an Error.

Alfine Scandens Baccifera C. B. P. *Cucubalum* Plin. Lugd. Turnef. has a *Pentapetalous Flower*, *flore caryophyllo petalis bifidis calice pelviformi vel instar Lychnidis cujus pistillus mutatur in baccam vel capsulam ovalem semina plurima Reniformia Placentæ adhærentia continentem*. The Reason it appears to be capsular, because it is not juicy. Turnf. Inst. R. H. places it *inter Herbas flore Caryophyllo cujus pistillum abit in fructum* after *Lychnidis* Species, and nearest to the *Lini* Species: By reason of the *Flower* and *Calix*, it is well enough placed, but by the *Fruit* it ought rather to be placed amongst the *Bacciferous* Plants.

Pimpinella Sanguisorba minor lævis C. B. P. has a *Monopetalous Flower*, divided into four Segments *ad Centrum usq;* whose *Calix* becomes a *Quadrangular Capsule*, in which are ordinarily contained two oval Seeds, or *Kernels*, sharp at one End. Turnef. in his *Elem. Bot.* gave them *Flores Pelviformes*; but in his *Inst. R. H.* places them *inter Herbas flore monopetalo rosato cujus calix abit in fructum* after *Moschatellina*, and I think very improperly; for the *Fruit* of *Moschatellina* is reckon'd *Bacciferous*: But I could never as yet find the *Fruit* come to any Perfection. There are several of the *Pimpinellæ* Species that seldom come to Maturity; therefore it is difficult to make Observations on them to purpose.

Ageratum vulg. foliis serratis I find constantly, with a *radiat Flower*, and is so placed by Turnef. Inst. R. Herb. so that he has corrected himself in this Particular.

I have been mistaken in my former Account I gave you of *Herniaria*, following too much the Faith of Dr. Turnefort, not having examined it nicely enough my self: Therefore what I have discover'd since is as follows. *Herniaria* Ger. J. B. has a *tetrapetalous* and
herbaceous

herbaceous Flower, whose *Pistill* becomes a round membranoidous carinulate, or striat Capsule, like the Fruit of the *Linum Catharticum*, divided into eight Loculaments, in each of which is contained one small Seed *Ovato-acuminatum*. Besides the four herbaceous *Petala*, that are green without and white within: It has also several *Stamina*; but those *Petala* never become the *Involucra Seminis*. This is what I have found on repeated Observations. *Turnef. Inst. R. H.* places it *inter herbas flore stamineo cujus pistillum abit in semen calice obvolutum*; and in the particular Note says, *Quoad pistillum deinde abit in semen in capsulâ oblongâ & striatâ, quæ calix floris fuit, reconditum*. But this Plant cannot properly be called *Stamineous*; for the *Petala*, or *Calix*, never become the *Capsule*, or *Involucra Seminis*; but they have a distinct thin membranaceous Capsule, as above described. You have also given it a *Stamineous Flower*, consisting of four *Herbaceous Petala*, and placed it amongst the *Polygonums*; but whether it can be properly called *Stamineous* for the Reasons above, I leave it for you to determine.

Quære if *Herniaria* Ger. J. B. (Pag. 69 *Synopseos*) be a distinct Genus from *Millegrana minima* Ger. (*Syn. pag. 207.*) The last is placed amongst the *Vasculiferous Plants*, with a *Pentapetalous Flower*; but more particularly amongst the *Alfines Species Anomalæ flore tetrapetalo*. This Note seems to agree even to the *Herniaria* Ger. J. B. in that it is *vasculiferous*, and has a *Tetrapetalous Flower*; the other placed amongst the *Polygonums*, and you have given it a *Stamineous*, but *Tetrapetalous Flower*: So that they seem not much to differ in Flower. The Reason of my Query is, because in all those I had occasion to meet with, both in *Ericetis*, on Lee-grounds, and in Corn-fields, I could never observe any Difference in the Characteristick, but only as to the Growth. I shall not question but there may be two distinct Genus's under that

that Name, but I should be glad to know if it is of your own Observation.

Eruca maritima Anglica siliquâ fungosâ Morisoni, plantæ genus flore ♂ calice tetrapetalo, cujus pistillus mutatur in fructum oblongum fungosum geniculatum & in duas capsulas divisum in quibus singulis unicum continetur semen oblongum. Turnef. Inst. R. H. pag. 212. makes this Plant a Species Crambes, under the Name of *Crambe maritima foliis Eruc. latioribus fructu hastiformi*; but it does not agree to the Character of *Crambe*; and therefore I think Dr. Herman was rather in the right, who says it has *capsulam Dyspermam*.

Anthyllis maritima lentifolia C. B. P. is placed in your Syn. amongst the *Pentapetalous* and *Vasculiferous* Plants, next the *Alfines* Species, and I think with very good Reason; for by observing the Plant, I find it to have a *Pentapetalous* Flower, and *Calix petalis ut plurimum bifidis cujus pistillus mutatur in capsulam subrotundam & acuminatum in cujus cavitate semina plurima rotunda & alba continentur*, so that it may very well enter that Tribe. I cannot find where Turnef. has placed it, except it be under the Name of *Alfina maritima supina villosa foliis lanceolatis in appendic. Inst. R. H. pag. 665*.

Equisetum foetidum sub aquis repens. As for the Flowers of this Plant, I could never observe it with any, *sed semina profert rotunda, ad singulos nodos foliolis adhærentia, foliis rigidis & asperioribus & brevioribus, odor gravis*.

Equisetum non foetens sub aquis repens. *Caules emit tit graciles glabros, intus cavos & succo viridi repletos, ad singulos nodos etiam semina profert minuta rotunda foliolis adhærentia, eodem modo ut in alterâ specie quæ foetida est*.

Equiseti foetidi sub aquis repens secunda Species. This Plant has longer, more slender, and smaller Leaves than the former, *ad Spithamæ unius longitudinem crescentia, more greenish, & non tam rigida ut in alterâ*
S f *specie,*

specie, sed semina profert minuta rotunda rubescentia ad singulos nodos foliolis adhærentia ut in priori specie, odor gravissimum. I know not if these two last Species be described.

Kali spinosum cochleatum, plantæ genus flore stamineo vel apetalo, cujus calix è 5 foliis acuminatis componitur, quæ simul juncta capsulam constituunt quasi echinatham, in quâ unicum continetur fermen subrotundum spiræ in modum convolutum vel cochleæ ad instar. Turnesf. Inst. R. H. pag. 247. places this Plant inter herbas flore rosaceo cujus pistillum aut calix abit in fructum unicap-sularem: After the *Junci* Species, and next the *Tel-lephii* Species, in the particular Note he says, *Quod pistillum deinde abit in fructum fere globosum membra-naceum singulari semine fœtum, cochleæ ad instar intorto & plerumq; petalis florum obvolutum.* On very strict Observation in all the Seasons of it, I could never discover any *Petala*, but only *Stamina*; so that I see no Reason for your giving it a *rosaceous Flower*, except one would take those *Echinac Leaves* of the *Calix* for the *Petala* of the Flower, which I think scarce any Botanist would do; and if it were so, it would be still a *Stamineous Flower*, even according to his own Sense of *Stamineous*, if the *Petala* become the *In-volucra Seminis*, as he says they do for the most part in this. In his *Elem. Bot.* he has given it also a *rosaceous Flower*, but wanting a *Calix*, whose *Pistill* becomes a round and membranaceous Fruit, in which one Seed is contained *Spiræ in modum convolutum*; but neither of these Characters agrees to this Plant: For I found it constantly as above described. So that *Turnesfort* must either be very far mistaken, or the Plant must vary in different Places.

Kali minus album semine splendente C. B. P. has a *Stamineous Flower*, whose *Calix* consists of five Leaves, and together compote a round *Capsule*, in which one round and shining *Seed* is contained. You have placed it amongst the *Blita*, but it does not agree

gree to *Turnefort's* Character of the *Blita*. He has excluded it from the *Kali Species*, but where he has reduc'd it I cannot find.

Lichen vulg. I could never observe it to have any Flower, but there arises from the middle of the Leaves a long, slender, and white *Pedicule*, *aliquando ad digiti unius longitudinem assurgens*. It is hollow and pellucid; on the top of which there is a round black Head, or Capsule, fitted with a farinaceous and greenish Substance, *quod reverà locum seminis supplet*; or the Seed it self, as observ'd by *Turnefort* with the help of a Microscope, and is *subrotunda*. This Capsule being so very slender, soon opens, or breaks, by the Heat of the Sun, and then it appears of the Figure as in *Turnefort's* Character, but is constantly round, (*ante rupturam*) so that it would appear *Turnefort* has not observed them in all Seasons: For early in the Spring it is easy to observe them as above described, but they are not able to endure Heat, and so quickly vanish.

Alfine rotundifol. seu Portulaca aq. minima Serpyllifol. This Plant was past the Flower: The Pistill of it becomes a round Capsule opening into two Parts, *horizontaliter*, & *pyxidis in modum*, in whose Cavity are contained many round and small Seeds. *Calix tetrapetalus*. It riseth about an Inch high; the Leaves resemble those of *Serpyllum vulg.* and the Capsules those of *Anagallis fl. Phæniceo*, but differs in this from *Anagallis*, *quod capsulae in alis foliorum positae sunt & pediculis carent*.

Asphodelus palustris Scoticus minimus, plantæ genus flore hexapetalo rosaceo, calice carente, cujus pistillum mutatur in capsulam oblongam acuminatam & in 3 loculamenta divisam, in quibus singulis semina plurima continentur aristata. You have placed it *inter bulbosiss affines*, without any particular Note of Flower or Seed-Vessel. Where *Turnefort* has classed it I cannot find, for his Book is deficient in a good Index.

316 *Dr. Preston to Mr. Ray.*

This Letter being sufficiently charged I shall reserve what other Observations I have made till another occasion. I doubt not but your *Supplement* to your History will be near compleated by this time; and as for your *Methodus Emendata* it is what I shall expect with impatience.

Edinburgh, Jan. 13. 1701.

Dr. Sherard to Mr. Ray.

S I R,

London, June 11. 1702.

I Forgot in my last to answer your Query about *Corymbiferous Plants*. Mr. Bobart told me Dr. Tournefort's making *Bidens* a distinct Genus, was a false Notion; for the Seeds of those Plants (as of many others of the *Corymbiferae*) had each four *Spinulae*, though two of them generally fell off before they were ripe. He says all those that have Quadrangular Seeds have four *Spinulae*, which in many Plants fall all off, in others only two remain.

*Mr. Ray's Answer to the Editor's Letter
of June 24. 1702. printed in Ray's
Hist. Insect. p. 262.*

S I R,

I Find that you have been very curious in observing the Generation of Gnats, to which I must needs own myself to be a great Stranger, having never seen any *Aureliae* of that Insect but those with Club-heads, whence I suppose our most common Gnat comes.

Of

Of the *Vermiculi* or *Nymphæ*, previous to these *Aurelia*, I knew nothing; and now I perceive that the change of one of these into the other is not instantaneous, by the casting of a Skin, as the change of the *Aurelia* into a *Gnat*, but gradual; so that this seems to be a different sort of Generation from the rest of this kind.

I think you need not doubt but that the perfect *Gnat* lays the Eggs in all these kinds, and that those that are fœcund, are render'd so by the coition of the Male and Female; for this is agreeable to the process of Nature in the Generation of all *Insects*, none ever generating till they have run through all their changes. As for the suddenness of laying their Eggs after their leaving the *Aurelia*-state, that needs not startle you; for 'tis usual for many of them to couple and lay their Eggs so soon as ever they are come out; the Females also may drop their Eggs without any coit, if there be no Male near.

From these different sorts of *Vermiculi* and *Aureliæ* doubtless do proceed various kinds of *Gnats*, notwithstanding I find but two described in Authors. Howbeit I think you mistake in charging *Swammerdam* with that Error; for I find in my *French* Copy of him these Words, *Car nous en trouvons des plusieurs sortes*. You will deserve well of those who apply themselves to the History of *Insects*, if you shall find out, describe and distinguish these Species.

For my part I am now almost threescore and fifteen Years of Age, so that it is time for me to give over these Studies and Enquiries; and besides I am so lame, and almost continually afflicted with Pain, that I cannot attend any Study, being diverted by Pain. 'Tis true of late Years I have diverted my self by searching out the various Species of *Insects* to be found hereabouts, but I have confined my self chiefly to two or three sorts, viz. *Papilios diurnal*, and *nocturnal*, *Beetles*, *Bees* and *Spiders*. Of the first of these I have
found

found about 300 kinds, and there are still remaining many more undiscover'd by me, and all within the compass of a few Miles. How many then may we reasonably conjecture are to be found in *England*, in *Europe*, in the *East* and *West-Indies*, in the whole World. The *Beetles* are a Tribe near as numerous as these, and the Flies of all sorts, not fewer. I have now given over my Inquisition, by reason of my disability to prosecute, and my approaching End, which I pray God fit me for. You that have more time before you, may profitably bestow some of your spare Hours upon such Enquiries, and may probably make useful Discoveries, at least may reap a great deal of Pleasure and satisfaction in finding out and bringing to light some of the Works of God not before taken notice of. So I heartily bid you farewell.

Black Notley, June 30. 1702.

At the time when this Letter was written, I was but a Novice in the History of Insects, particularly of *Gnats*, having begun my strict Observations of them but the foregoing Spring. In order to the Discovery of the process of their *Generation*, I shut up in Glasses divers *Nymphæ*, and *Aureliæ* of *Gnats*, with the Water in which they were produced; and after all the *Aureliæ* were become *Gnats*, and the *Nymphæ*, *Aureliæ*, I found there were other *Nymphæ* succeeded; and not having seen any Eggs in the Water, I very inadvertently concluded that those *Nymphæ*, or at least the *Aureliæ* (which I thought might be more perfect Animals than I afterwards found them) might lay Eggs, and be the Parents of those succeeding *Nymphæ*. But I soon found my Error, and that what my Friend Mr. Ray saith in this Letter was true, and also discover'd the whole process of the Generation of *Gnats*, and that this Tribe of Insects is much larger than was ever imagin'd: For in the Parts only near *Upminster* in *Essex* (where I then lived) I discovered
above

above 30 distinct Species of them, both Male and Female most of them, and saw many of them in their Coit, how they reposite their Eggs, &c.

Mr. Ray to Sir Hans Sloane.

S I R,

Black Notley, Dec. 16. 1702.

A Bout the beginning of this Session of Parliament, I received a very courteous and obliging Letter from my *Lord Bishop of London*, wherein among other things he desired me to send one of my Friends to treat with him about the design of procuring *Figures for my History of Plants*. Whereupon I wrote to Dr. *Sherard*, to desire him to attend upon his Lordship for that purpose; but he being one of the Commissioners for sick and wounded Soldiers, was sent to *Portsmouth*, where he still resides, so that he could not fulfil my request. Yet I cannot excuse him, for deferring thus long to give me notice thereof, the Business requiring haste; and my Lord advising that what is done would best be done while the Town was full of Nobility and Gentry during the sitting of the Parliament.

Now, Sir, understanding that you are acquainted with the *Bishop*, I must beg the favour of you to attend his Lordship, and to do that which I requested of Dr. *Sherard*, that is, to give him your Opinion whether the thing be feasible, and what Difficulties are likely to occur in it, and what is the best Method to proceed in. I conceive the great Difficulties will be in procuring *Gravers*, and *Supervisors*, to make choice of the best *Patterns* of Plants that are already published, and get such delineated as they can procure Specimens of; and to *superintend the Gravers*, to see they do

320 *Mr. Ray to Sir Hans Sloane.*

do their Work well, and to put *Titles* to the several Sculps, &c. Such Supervisors I doubt it will be difficult to find, and Pensions or Salaries must be allowed them; I was loth to give you any trouble about this Affair, because I know you to be full of Business, and to have but little time to spare: But I am constrained, Dr. *Robinson* excusing himself, for not being acquainted with the Bishop.

Sir Hans Sloane's Answer to Mr. Ray.

S I R,

London, Jan. 14. 1702.

I Receiv'd yours, and have spoken to the *Bishop of London* about the *Graving the Plates for your History*. He seems to be in very good earnest about it, and without question will be able to do very considerable Matters in it; but I find Dr. *Sherard* and others think it impossible to be effected. I will enquire a little farther into it, and talk with Dr. *Sherard*, Dr. *Robinson*, and Mr. *Petiver*, &c. and then again discourse his *Lordship* about it. I imagine it would be best done by Sections.

Mr. Ray to Sir Hans Sloane.

S I R,

MR. *Dale* tells me that some of my Friends at *London* talk of imposing a new Task upon me, that is of describing such *exotick Insects*, as are found in the *Musæum's* of the *Virtuosi* about *London*; which if there be no more able and better qualified Person living in or near the City, for such an under-

undertaking I should not be much averse from, if it please God to continue me any tolerable measure of Health and Ease; for that I may do fitting, and without much motion, but then they must be sent down to me by Parcels. As for our *English Insects*, I think I may, without Vanity, say, that I have taken more pains about some Tribes of them, than any *Englishman* before me. If I were to publish a *History of Insects* in each Tribe, I would first place the *English* ones by themselves, and then the *Exoticks*.

I have by me a History of our *Diurnal English Papilios* of my own knowledge, which I drew up some Years since, they are in number about 40. I understand that Mr. *Petiver* hath several new ones sent him out of *Cornwal*, which I suppose he will shortly publish. In case you think fit to employ me in this Service, I would begin with the *Tribe of Papilios*; because therein I have taken the most pains, though that be far from the first Tribe. For I divide *Insects* into *Apoda* and *Pedata*. And *Pedata* into *Pedata tantum*, and *Pedata & Alata simul*, and these last I would divide according to *Swammerdam's* Method.

Black Notley, Febr. 23. 1702.

Mr. Thoresby to Mr. Ray.

Honoured S I R,

THIS additional List of *Local Words* is larger than I expected, and therein you will quickly observe several Words already inserted in your very curious and accurate Collection; but then 'tis either when the same Word has a different Signification, (which is not uncommon) or pronounced after so different a Manner, as considerably to alter the Orthography: Or lastly, when the Etymology has fal-

len in my way in the Perusal of some of our *Saxon* Authors, as *Wheelocks*, *Bede*, *Somner*, *Spelman*, *Hicks*, &c.

I am tempted to think the *German* Silk-tail, register'd in the *Philosophic. Transf. N^o. 175.* is become natural to us, there being no less than 3 kill'd nigh this Town the last Winter. *Leeds, Ap. 27. 1703.*

A.

A Lack for Alas.

Alas-a-day. } Alas, a Form of pitying.
Alas-at-ever

After-maths, q. After-mowings, the Grass in the Meadows, that grows after the mowing the Ed-dish; Roughings we take for that rough course Grass the Cattle will not eat.

Arls or *Earls*, earnest.

An *Arvil*, a Funeral Treat; the Word and Practice retained in the Vicarige of *Hallifax*. I was at one for an ancient Minister a few Months ago.

As or *Asse*, *Ashes*, var. dial.

As tite, as soon; *titter*, sooner.

An *Ashler* Wall, Free-stone hewed with a Mason's Ax into Smoothness, q. Axtler.

Aud-farand, out of Fashion when applied to elder Persons; and witty above their Age, when to Children.

Aukardly, opposite to towardly.

An *Awmoss*, Almes, from *French* *Aumosnes*.

Awn, own, var. dial. As agen.

B.

Backus, Bakehouse.

Very *Bain* about one, officious, ready to help.
Bang his *Banes*, beat his Bones.

Bawks,

Bawks, the large Timber Beams that support the Roof by Sign-trees, under the Side-wavers, and a Prick-post under the Rig-tree, Summers or Summer-trees are never contiguous to the Roof, but only the main Beams in a Chamber-Floor.

Bannock, &c. *Tharfe* Cakes.

A *Barn*, a Child, S. beapn, ii. *Math.* 18.

A *Barn*, a Garner, S. *Math.* iii. 12.

A *Barr*, a Gate of a Town or City, Mickelgate from, S. mycel, not St. *Michael*.

Bawt, without. A *Bawl*, Bowl.

Beiling, Matter mix'd with Blood running out of a Sore.

Beneson, Benediction.

A *Benkit*, a small Wood Vessel with a Cover that's loose, and fitted with Notches to two prominent Lags that have a String thro' them to carry it by.

To *Bezle*, waste, embezle.

To *Bid* or *Bead*, to pray, from S. beade oratio.

To *Blare*, to put out the Tongue.

To *Blate* or *Bleit*, proper to a Calf's or Sheep's Voice.

Bleak, exposed to the Weather, it stands bleak.

A *Binding*, a Hazel Rod, or Thorn, 2 or 3 Yards long, so called, because used for binding the Hedge-tops.

Blew Milk, skimm'd Milk.

Blind-mans-buffe, a Play.

Bloa, black and blue.

A *Blowse* or *Blawze*, proper to Women; a Blossom, a wild rinish Girl, proud light Skirts.

A *Bloated* Look, a bloa, dusky, dark Countenance, caused by Intemperance mostly.

To *Boken*, to nauseate, ready to vomit.

The *Booght* of the Elbow.

Boons or *Booyns*, Foul and sometimes Labour, to be given to the Landlord, over and above the Rent, from the *French* Boon.

The *Boyl* of a Tree.

A *Booyse*, or *Buyse*, same as Boose or Stall.

Brakons, Fern, Brakes.

A *Brandred* or *Rid*, a Trivet, or Iron.

You *Braid* of the Miller's Dog.

Bown, as whither art thou bown, *i. e.* going or bound.

A *Breid*, a Shelf, or Board, var. dial.

To *Breiden*, to spread or make broad.

A *Brock*, a Badger.

A *Bridle-fly*, a Way for Horse only, not Cart or Carriages in common.

A *Broych*, a small Spike of Iron or Wood to put Coppins on.

To *Broych*, or broach, as Masons an Atchler, when with the small Point of their Ax, they make it full of little Pits, or small Holes.

To *Bruzzle*, to make a great Ado, or Stir.

A *Bumper*, a Glas or Mug brim-full.

A *Bur-tree*, an Elder or Dog-tree.

A *Burk-tree*, or Rods, Birch, var. dial.

Bytte (*Warwickshire*) a Bottle or Flagon, ab S. bytze uter, dolium.

C.

TO *Cadge*, a term in making Bone-lace.

A *Cankerd* Cart, or froward Fellow.

To *Cape* a Wall, to crown it.

A *Carding* of Wool.

A *Caw*, Cow, var. dial.

A *Cawl*, or *Coul*, a Lump rising in the Head thro' a Knock.

To *Caure* down, to ruck down.

To *Cast* or *Kest*, to vomit.

A *Caup*, as a muck Caup.

A *Chare*, or *Char-woman*, one hired by Day (not a fixed Servant) to wash.

Chaffer, to chaffer, exchange.

To

To Chase a Laughter.

Chid, rebuked, S. cisse.

Chizzel, Wheat-bran.

To Clatter, make a Noise, talk fast and loud.

A Clawt, a tatter'd Cloth, or Rag.

Cleam'd, dawb'd on as with a Trowel.

Clem'd, or clam'd, pined, hungered.

Clinch, or clunch-fisted, covetous.

I'th' Clout, drunk.

A Clughe, a Valley between two steep Hills.

Clumps, bungling.

Clukes, Clutches.

Clots, Clods, var. dial.

A Clumpst Fellow, *i. e.* plain-dealing, that speaks at the Mouth, *Prov.*

A Clunter, an unnimble Stumbler.

Coap, Fight.

Cobby, Sawcy.

Coits, Coats, var. dial. Thou'rt a Lad i' Coits, spoken to Men ludicrously.

Coddy, joyn'd with little, to diminish, as a little Coddy Lamb, Bird, Fly --- is exceeding little, perhaps but a var. dial. for Conny.

Cokend, choaked.

Com, came, S. com *Mat. ii. 21.*

To Con. *i. e.* ply a Lesson as School-boys.

A Coppin of Yarn.

A Cottrel, a piece of Iron with a Hole in to fasten.

A Cragg, a stony rocky Bank, &c.

A Dish Cratch, same with the Cradle.

Crawse, Jolly, Brisk.

To Creak as a Door.

Cree'd Wheat, hull'd and boyl'd.

To Crinkle, to crouch, to yield sneakingly.

Cowks, or Cinders, Coals burnt in common Fire, not charr'd.

D.

TO *Daker*, to work for Hire after the common Days Work is over, at 2 *d.* an Hour.

To *Darne*, *i. e.* fow up Holes, so as not to pucker, but fill them up.

A great *Deal* or *dele*, S. Sælaf Parts, *Mat.* ii. 22.

To *Deeght* Ing, spread Mole-hills.

To *Dither*, to quiver with Cold.

A *Dingthrift*, a Spendall, Prodigal.

To *Dizen*, to be curious and look big, to fit in State, as if great.

Dodges on, keeps poorly doing.

Dog-tree, Elder.

A *Dole*, *Dool*, or *Doal*, a Share or Part in a Town-field; also Money or Bread distributed at a Funeral to the Poor.

To *Dree*, to be able to go thro' to the End of the Journey.

A *Dribble*, an Iron-pin that Carpenters use to drive out wooden Pins.

Drigh, long, tedious.

A *Dubler*, a Platter.

A *Dub*, a Puddle, or Plash of Water.

The *Dule*, Devil, var. dial.

He *Dung*, or *Dang* it down, threw it down.

To *Durse* is to dress, to durse the House, Horses.

To *Durse* the Ing, to spread the Mole-hills and Dung that's in Fields.

E.

Mine *Eam*, my Uncle, S. eame avunculus.
For *Eance* (once) and use it not.

An *Eapns*, hands full.

Earnder, Forenoon drinking.

Edge you Brethren, make room, give way.

Eeen for Eyes.

To *Eek*, enlarge, S. *ican augmentare*.

Een for even, var. dial.

To *Elt*, to beat in the Dough with more Meal and Yeast.

Murk i'th' *Eemin*, dark in the Evening.

Een, Evening, *per Aphæresin*.

F.

THE *Fag* End, the hinder or latter End.

I' *Fake*, Faith, (an Oath).

Far, for farther, as the far Bank.

Fastne's een, the Tuesday before the *Dies Cinerum*, or Ashwednesday.

Fat (in Composition) Vessel, as in Guile *Fat* ab S. *fat vas*.

Faugh, Fallow Ground.

To *Faugh*, to plow, and let it lie fallow a Summer or Winter.

Faw, } foul, dirty.
Fawl, }

Fear'd, frightened, afraid, S. *araped*.

Feer, or *Fere*, Wife, S. *geſepa socia*.

To *Fest*, i. e. put out Apprentice.

To *Fitter*, to kick smartly with the Feet, as Children do when pettish, metaphorically to be in a Passion, a pelting Chafe.

To break or tear all to *Fitters*, is to reduce to the smallest Bits.

A *Filly-foal*, from S. *pytian* to follow the Mare.

A *Flacket*, a Wood or Leather Vessel.

A *Flask* for Water to wash in, ab S. *fatēp flaxan*.

To *Fling*, to throw.

To *Flire*, or *Flear*, laugh scornfully.

Flaughter'd, affrighted.

A *Fleyk*, a Hurdle made of Hazel, or other Wands radled,

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radled, for the Clothiers to swing, or beat their Wool upon.

He *Float* me, chid or scolded.

Flue-full, brim-full, flowing full.

A *Flurts*, a light House-wife.

Yau'r Mains *Flush*, full-handed, prodigal, wasteful.

To *Fodder*, *i. e.* give Hay or Straw to Cattle.

Fogg, or Edish, is the second Growth of Grass (after mowing.)

To *Forebeight*, predetermine.

A *Fodder* of Lead.

Forspoken, bewitched, forespoken.

Frayn, (*Lanc.*) ask, S. *beppan* interrogare.

Freem, handsome.

A *Frosk*, Frog.

A *Fruggan*, applied to stirring Women.

To *Frust*, trust for a time.

Fulsum, nasty, foul.

Fur, far, var. dial.

A *Fur*, or *Foor*, a Furrow.

G.

TO *Gang*, to go, S. *gang*.

Gant, lusty, hearty and healthful.

Gar'm ken us Ale, prodigious strong, make them know us.

A *Garson*, a Foregift at entering a Farm, a Godspenny.

To *Gaup*, to stare about with open Mouth.

A *Gaufter*, a hearty loud Laughter.

A *Gawd*, a Guise, Custom, Fashion.

Gawk Hand } Left Hand.
Gallock Hand }

Gawa, go we, let us go.

Geen, given.

Gemean Mather, the common Sort, S. *gemæne*,
Matth. viii. 29. from whence the present *Dutch*
Gemeyn, common, vulgar.

Gestings, q. *Geestlings*, young Geese.

Gif, if, S. *gif*, si.

Do you *Gawm* me, understand, or mind me.

A *Gladden* is a void Place, free from Incumbrances.

To *Glawm*, to look sad.

To *Glee*, to look askint *Yorksh.* as well as *Linc.*

To *Glizzen*, glister or sparkle, as Stars in Frost, it
 freezes hard, and een glizzens, (in which Sense a-
 lone 'tis used.)

Gloppen'd, surprized.

To *Glore*, to look staringly.

Goyts of Mills, where the Stream passes out.

To *Graw* before the Ague Fit.

Grant, Wort, sweet Drink, Ale before it be wrought
 with Barm.

Greefe, or *Greece*, Stairs.

The *Groyn* of a Swine, the Snout.

A *Groop*, the hinder part of the Mystall, where the
 Cattle dung.

Griesly, ugly, grissled.

Guizend, odly and sluttishly habited.

A *Gyste* for Cattle, to be pastured.

H.

A *Hackslaver*, aasty slovenly Fellow, both in
 Habit and Deed; but it has a peculiar Respect
 to speaking ill, naturally or morally.

To *Haggle*, to cut irregularly.

A *Haking* Fellow, an idle Loiterer.

Hala, bashful, nicely modest.

Hame, home, S. ham.

Happens, perhaps.

Hard, for covetous, and in some Places for half drunk.

Harenut, Earthnut.

Harns, Brains, *Yorkshire*.

Havers, Manners.

To *Heald*, to lean to one Side.

A *Hebble*, a narrow, short, Plank-bridge.

The *Heck* is ordinarily but half a Door, the lower half.

Hen-barrow, a Kind of Kite Harrier.

To *Hent*, to catch a flying Ball.

Height, called, &c.

To *Height*, to threaten.

To *Higle*, to loiter long in buying.

Hineberrys, Raspberrys.

Hippins, Steppings, large Stones set in a shallow Water at a Steps distance from each other, to pass over by.

Hitter, eager, keen.

Hoast, Cough, à S. *hporça*.

A *Hoppet*, a Seed Basket; also that in the Mill in which the Corn is put to grind.

A *Hooyze*, a half-Cough, proper to Cattle.

A *Host*, a Cough.

A *Hullet*, (a Howlet) an Owl.

To *Hype*, to gird at, to cast out disgraceful Words.

A *Holt*, a *Wood*, S. *holt* sylvā.

I.

AN *Ing*, a plain even Ground (mostly Meadows) by the Water-side.

To dress the *Ing*, that is the Mole-hills, and Dung, which is durst or drest, *i. e.* spread abroad with an Ing-rake.

An *Inkling*, an Intimation, or Notice.

An *Ize-bone*, the Huckle-bone, the Coxa.

A *Junket*, a Wicker-long Wisket to catch Fish.

K.

TO *Keive* a Cart, whelm on one Side.

A *Keiver*, a Bumper, or Brimmer of Liquor.

A *Kitt*, a Milking or Water-pale, with one or two Ears, with or without a Cover.

A *Kiting*, a Term of Reproach.

It stands *Kittle*, *i. e.* ticklishly, ready to fall.

Knogs, Nine-pins.

A *Konny* thing, a little, as well as a fine thing.

A *Kivver*, or *Kimlin*, a Powdering Tub.

L.

TO *Lag*, to come last behind, as if tired, flag.

Laird, (Scoticè) Lord, S. *blafopd*.

To *Lake*, play, Goth. *Amhs*, *ludere*,

Lang, long. var. dial. S *lang*.

Langholds, Spaniels upon Horses Feet, fastned with a Horse-lock to keep them from leaping wrong.

To *Lane* nothing, to conceal nothing.

To *Lant* Ale, to put Urin into it.

Laughter, laying as a Hen lays her Laughter, that is all the Eggs she will lay that time.

To *Lawk*, *i. e.* weed Corn.

Lafs-a-day, (alas) an Expression of Condolence.

I'd as *Leive* do so, as willingly, 'tis equal to me.

Leathwake, limber, pliable.

Leasing, Lying, à S. *Learung*, *mendacium*.

Leath, Ease or Rest.

Lear, laugh deridingly, fear.

Leet you, pretend.

Ley, fallow Ground.

To *Leyse*, to pick the Slain and Trucks out of Wheat.

A *Libborn*, a Sow-gelder.

To *Litt*, to colour or dye, whence the Name *Lister*, or *Litster*.

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Listring, thickening, *Yorkshire*, as well as *Ches.*

To *Loup*, or *Laup*, to leap.

To *Lug*, to pull one by the Hair, or Ears, lugs.

A huge *Lunshin* of Bread, a large Piece.

M.

M *Aine*, as by Might and Main, S. *mægen*.
To *Maine*, to lame.

A *Malkin*, a Cloth at the End of a Poll, where with wetting it, they cleanse the Bottom of the Oven, applied to a Slut.

Mare, more, var. dial. S. *mape*.

Mate, Match.

My *Maugh*, my Brother-in-law.

A *Mawkin*, a dirty Frow.

Mawm, tender, fryable, short, mellow.

A *Maz'd Goose*, applied to a Person astonished, amazed *per* *Aphæresin*.

Meedless, without Measure.

Just *Meet*, exact.

Meeterly, indifferently, *meeterly*, as *Megge Rylay* danc'd.

Mensfull, neat and clean.

Menya, a Family, a House *Menya*, S. *Menio*, *Mat*, viii. 1.

A *Midge*, no Gnat, but the smallest of all Flies.

Millums, watry Places about a Mill-dam.

A *Minstre*, Cathedral, S. *Mynstre* Chri.

Miscryed, discovered.

It *Mizzles*, rains small, like the falling of a Mist.

To *Mobb*, to dress awkwardly.

A *Moofin*, a Wheat Cake, bak'd upon a Bake-stone over the Fire, as Oat-cakes.

Moolter, Toll of a Mill.

A *Miln* and *Milner*, for a Mill and Miller.

Welnee Moyder'd, almost distracted.

To *Mooyfen*, i. e. wonder, from museing.

Mucky,

Mucky, dirty, as the Streets in rainy Weather; *Muck*,
Towngate Mire, as well as Dung.

It *Muggles*, rains small, Mist like.

Munsworn, forsworn.

Munt, hint, as I know your Meaning by your munting.

My stall, Mewstall for Cattle, Oxen and Cows.

N.

NAR, nearer.

A *Nawt-heard*, Neat-heard.

Nawt-foot-same, the Oyl or Grease that is boiled out
of a Neat's-foot.

A *Neave*, a Fift.

I did not *neigh* it, came not nigh it.

My *Neame*, or *Neme*, my Uncle.

To *Net*, to wash Cloaths, give them a Net.

A *Nether*, or *Nedder*, an Adder, à S. *nesspa*
Mat. 3. 7.

Nifles, are Glandules, Kernels, which being hid
and cover'd with fat, perhaps might either be de-
nominated from, or denominate covert and secret
filching of things, *Nifling*, *Nifle*.

Nise, strange, nise Work, strang.

Nise, apply'd to a Person, is precise, opposite to free
and hearty.

He *Nim'd* it, took it, S. *nim*, St. *Matth.* 2. 20.

Nogs, Shank-bones, hence playing at Nogs, or Nine-
pins, because the Bones of the Shanks of Cattle are
used therein.

O.

ONters, many Onters, Pretences, Alledgments,
Scruples.

An *Oskin* of Land, an Oxgang contains 10 Acres in
some Places, in others 16, 18, 24, and 50 in some
part of *Bradford* Parish.

Ossell,

Offell, perhaps.

Ounfel, a Title of Reproach, sometimes apply'd (as by Mr. Garbut, in his Demonstration of the Resurrection of *Christ*) to the Devil.

Ournder, Afternoon drinkings.

An *Ows*, an *Ox*, *Gothicè* & *Cimbricè* **XAIRAN**,
Dr. Hicks's Grammar, p. 6.

An *Ox-Boyse*, an *Ox-stall*, à S. borih, *præsepe*, a Boose.

P.

A *Paddock*, or *Parrock*, a small narrow Close, that is an *Appendix* to a greater, for the most part.

Pan, that described as the Pan in a Building, is properly the Wall-plate, the Pan is that piece of Timber in wooden Houses, that lies upon the top of the Posts, and upon which the Balks rest, and the Spar-foot also.

Parrisht, starved with Cold, *qu. perisht*.

Pash, I'll pash thy Harns out.

Pat, fit, proper, pat to the purpose.

To *Pee*, is also look near and narrowly.

Peel the Pot, (cool it) with the Ladle, taking out and pouring in again.

Peil, stir, what a Peil keep you?

Perepoint, a perepoint Wall made of a thinner sort of hewn Stone, set upon the edge.

A *Pigtail* Candle, the least, put in to make weight.

A *Plat*, a Place.

Pock-arr'd, marked with the Small-Pox.

To *Poyt* the Cloaths off.

A Fire *Poit*, an Iron to stir up the Fire with.

A *Prigge*, a little Brass Skellet.

To *Pucker*, to draw up like a Purse, unevenly.

A *Puddle*, a fat Body.

Q.

Quite for wholly is general, for Quit *Northern*,
'twill not quit cost.

R.

Radlings, Hazel, or other Boughs, put within the
studs of a Wall, to be cover'd with Lime or
Mortar.

A *Rawp*, a Hoarsness.

To *Raume*, to reach.

The *Reefe*, the Itch, *reefy*, itchy.

To *Reek*, to smoke, à S. pec, smoke.

What a *Reuls* here?

You make a nise *rent*. } *i. e.* work, mad work,

Rinish, wild, jolly, unruly, rude.

A *Riggald*, abusively, apply'd to Men as well as to
Cattel.

Roky, misty.

To *Rooyse*, to extol.

A *Roup*, a Hoarsness.

Rudd, red Stone.

A *Rudle*, a Ridle.

Ryndta, used to Cows to make them give way, and
stand in their Stalls or Booyfes.

S.

I *Sagh*, I saw.

Samme Milk, Butter in the Churn, after the Milk
breaks into Butter, à S. *ramman conglobare*.

Saur, Sour, Mend like four Milk in Summer, *Prov*.

Sawl, Soul, var. dial. S. *ragel*.

I'll *Saul* him, beat him.

To *Sawce*, *Rustic. pro* sowce, box the Ears.

To *Scream*, cry aloud.

Scraby-

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Scrubby-Grafs, var. dial. for Scurvy-Grafs.

Scug of a Hill, the declivity or side.

Seaves, pill'd Rushes, of which they make Seav Candles.

Sel, *Seln*, self.

Sere, several, *seve ways*, several ways.

A *Setle*, a Seat, à S. *recl*.

To *Shaffle*, a *Shaffles*, a Bungler.

To *Shale*, (proper to the Feet) in with the Heels and out with the Toes.

No *Sheds*, no difference.

To *Shill*, as Pease, to take them out of the Swads.

A *Shive* of Bread, cut off the Loaf.

Shoe, or *Shs*, *illa*, She, var. dial.

Shooen, or *Shune*, Shoes.

Shool, Shovel, var. dial.

Shooyts, Shovel-board, where the Shillings are directed as at a Mark in shooting.

Cow *Sharn*, or Dung.

Shrogs, a company of Bushes, of Hazel, Thorns, bri-ers.

The *Sile*, used in straining Milk.

It *Siles*, *i. e.* rains fast.

To *Sipe*, to let all the Water or Liquor out, which cleaves to the sides of a Vessel, after the main is pour'd out.

Skath or *Scath*, loss, à S. *Scade nocumentum*, as the Scath came in at his own Fence, *Prov.*

A *Skeel*, a Kit or Milking-pail.

Skeller'd, warpt,——*Yorkshire* as well *Darbysh.*

Skeer the Esse, *vide* Esse.

Skanskback, easily knowable, having some special mark.

To *Skimmer*, shine, look bright.

A *Slamtrash*, a slovenly dirty Person.

To *Slap* one, *i. e.* beat, à *sono verborum*, *vox óνομα-τοπ.*

To *Slart*, to plash with dirt.

To *Slap* out the Tongue.

To *Sleat* a Dog.

Slim, sometimes signifies crafty, knavish, a slim Customer.

To *Slive*, to clear, to rive.

A *Sliving*, a lazy Fellow.

To *Slot* the Door, to bolt it when shut.

A *Slough*, a watry boggish Place, *item* the cast Skin of a Snake.

A *Slush*, wastful.

To *Slush* thro' work, to do much, but slimly, carelessly.

A *Smithy*, a Smiths Shop.

To *Smoar*, to smother *per contrac.*

To *Snaffle*, to speak through the Nose.

A *Snaffle-Bridle* or *Bit*, snape Bit.

A *Snap*, a Lad or Servant, now mostly used ludicrously, à S. Snapa, *puer*, Matth. 8. 13.

To *Snattle*, to linger, delay, *magno conatu nihil agere.*

To *Snavle*, Snivle, speak through the Nose.

Snever, slender, smooth.

To *Snift*, to draw the wind smartly up the Nose.

A *Snicket*, one that pincheth all to nought.

To *Snite*, is to blow the Nose, to wipe is to dry it.

A *Sod*, a Turf, is thin and round, or oval, taken from the surface of the Earth; a Sod thick and square, or oblong mostly.

Soncy, cunning.

To *Sonter*, to loiter, a *santering* or *sontring* Body, one that squanders the time in going idly about.

To *Sosse*, proper to Dogs.

To *Souje* or *sawse* on the Ears, *i. e.* box.

Snuffers for the Nose, or Nostrils.

A *Spaniel*. *Qu.* If not the S. name for N. Langholds, we have in these Parts no other name but *Cow-ty*.

To *Sparkle* away, disperse, spend, waste.

To *Speer*, enquire the Road, à S. Spypian *scrutari.*

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- A *Spelk*, a wooden Splinter tied on, to keep a broken Bone from bending or unsetting again.
- Spick and span new*, that has never been worn.
- To be *Spurr'd*, is to have the Banns of Marriage ask'd.
- To *Squat* down, to cour down suddenly.
- A *Stawk*, *i. e.* Stalk of Plants.
- Stark*, stiff; weary, also covetous.
- Staupings*, winter Steps, the holes made by the Feet of Horses and Cattel in miry Highways and other Places.
- Stavers*, Hedge-stavers, *i. e.* Stakes.
- Stav'd*, *Stawv'd*, as a Hedge that is cut.
- To *Steim*, to bespeak a thing.
- Stevon*, a strong sounding Voice, à S. *Stępn*.
- A *Stiddy*, an Anvil.
- A *Stigh*, a Ladder.
- Storcks Bill*, to *storken*, proper to fat growing cold, and so hard.
- Stowd*, cropt as Horses Ears.
- Stradling*, strutting and striding.
- Strea*, Straw.
- To *Streik*, stretch out the Limbs.
- A *Stroak* of Corn with us is but half a Bushel, or two Pecks.
- A *Stroom*, *Strawm*, the Instrument to keep the Malt in the Fat, that it run not out with the Liquor.
- Strunted*, cut off short.
- A *Swaithe*, the row of Grass cut down with the Scythe.
- Laid o'th' *Swaithe bank*, is spread abroad.
- Swamous*, Modest.
- A *Swamp*, a boggy bottom, a soft rushy Piece.
- A *Swatch*, a shread of Cloth.
- To *Sweal*, as a Candle with the Wind.
- A *Swine-Coat*, Hogs-stye, à S. *Loze*, *domuncula*.
- To *Swinge*, Scourge, à S. *Spingan*, to thresh.
- To *Switch* a Hedge, *i. e.* to cut off all the outlying Boughs.
- To *Swither*, to singe.

Taplash,

T.

T *Aptash*, small Beer, or thin Drink.
A *Tarrant* (*forte pro* Tyrant) a crabbed froward Fellow.
A *Tavern*, a Cellar.
To *Tawr* with the Hand.
A *water Tawv*, a swooning Fit.
A *Teathy* body, peevish, crabbed.
A *Teeming*-woman, *i. e.* Child-bearing-woman.
A *Tether*, Tedder, var. dial.
Thar-Cake, or *Hearth-Cake*.
Tharms, Pudding-skins.
Thaw, thou, var. dial.
To *Thoyl*, afford.
To *Thraw*, to turn Wood with a Tool.
A *Threave* of Straw, a Burden of it.
A *Thwang* for a Shoe, the Latchet, S. *Spanz*, a Thong.
To *Tifle*, to stifle, over-set.
A *Tifled Horse*, when broken above the Loyns.
To *Tipe* over, fall, or over-turn.
Tiper-down, strong Drink, for tipping over.
Tipsey, almost drunk, from tipling.
Titter and better, sooner.
To *Topple* down, fall.
Toota well, very well, too too well.
A *Tooming*, Wool taken off the Cards.
Topsy-turvy, upside-down.
Trowth, as Faith and Trowth, S. *Tpeopde*, *Fides*.
A *Trippet*, a quarter of a Pound.
To *Trush*, to run through all the dirt, *à sono ovom*.
To keep *Tutch*, to be as good as the Promise.
Tuta, too too; thou'rt tuta earnest, clamorous, covetous, importunate, unsatisfyable.
Turlings, Coals about a fifts bigness.
Twills, Quills.

U.

U *Ncouth*, strange, uncommon, unusual, à S. un-
coð, unknown.

An Urchion, a Hedge-hog, Urchin.

Uvver, for upper, or over, var. dial.

Varfall, universal.

W.

A *Waag*, a Leaver.

To *Wade* the Water.

Wae'st heart, a condolence to the same purport with

Wae's me, Woe is the Heart, &c.

To *Waite*, to blame.

Walker's Earth for scowring the Cloth.

A *Waugh-mill*, Fulling-mill.

Waugh, insipid, unsalted, and so unsavory.

The *Wawks*, or corners of the Mustachios's.

Wamb, Womb, var. dial. S. *pamb*.

Wane, decline, the Moon is in the Wane, S. *Pani-*
an, minuire.

War, stand aside, give way, beware.

Warld, i'th' varfal Warld, universal World.

Warse, worse, var. dial.

To *Wax*, grow, S. *peaxan, crescere.*

A *Wee-bit*, a tiny wee-bit, a small piece, (a pure
Yorkshirism).

Weet, i. e. wot, know, I weet full well.

Weeting, Urine,

Weiky, moist.

To *Ween*, think, à S. *penan, opinari.*

Welling, boiling.

To *Welt*, to totter.

To *Welt* or *Wolt*, overturn Cart or Wain.

Wellaneering, alas.

Wel nee, well-nigh, it's wel-nee Night, almost.

West,

Wesh, or wash, Urine.
 To *Whakker*, tremble, shake every joint.
Whaint, strange, odd, implying naughtyness, whaint
 wark.
 A *Whamire*, a Quagmire, var. dial.
Whawm, } overwhelm, is whawmed over.
Whelm, }
 A *Whein*, a Quean.
 A *Wheel-pit*, Whirl-pool.
Wheemly, neatly.
Whak't, for quaked, whence
Whakers, for Quakers, *le Trembleurs*.
Whart, Quart, meit m'a Whart o Ooyl, *i. e.* mea-
 sure me a Quart of Oyl.
Whilk, which, S. philc.
Whilkin, whether.
White, for quit, it will not white cost.
 To *White*, to cut Sticks with a Knife, and make
 them white.
Whiskin or *Whisking*, adjectively is great, applied to
 almost any thing, as Floods, Fire, Winds.
Whisking is also switching; there will be whisking
 for't, also beating, swinging, whipping.
Whreak, to speak in gutture, and whiningly.
 A *Why*, an Heifer.
Wight, swift.
Wind-raw, Grass or Hay rak'd into long rows for
 drying.
Wine-berries, not Grapes, but Gooseberries, Pin-be-
 pian, *Matt. vii. 16.*
 A *Wither*, strong Fellow.
 A *Wogh*, any Partition, whether of Boards or mud
 Walls, or Laths and Lime; as a Boardshed-woagh,
 studded wogh.
 A *Woggin*, a narrow Passage between two Houses.
 To *Wolter*, (as welter.)
Wormstall, shelter for Cattel in hot Weather.
Wote, know.

Y.

TO *Yall*, and to *Yawl*, or *Yowl*; the latter appropriated to Dogs, the former to Bawlers, in yall the *a* sounds as in that, in yawl as in the rustick Caw for Cow.

A *Yawd*, a Horse.

Yeast, Barm.

To *Yeather*, to beat with a long Hazel, Thorn, &c.

Yeeke, Itch.

Yield, i. e. Reward.

The *Yeender*, or *Earnder*, the Forenoon, *Hallifax* in *Yorkshire*.

Yew, you, var. dial. S. *ȝep*.

Yews for Ews.

Yooye, *Yule*, *de Yule*, vide *Mareschalli Observ. in Version. Anglo-Sax. Evang.* p. 520.

Mr. Ray to the Editor.

S I R,

YOURS of *August* 28 came to hand, for which I return Thanks. I am sorry you cannot as yet perfect your *History of Gnats*, of which I admire you should discover so many distinct Species, indeed that there should be so many *in rerum natura*.

As for the *Cimices* they may easily be compassed; but to find out, describe and methodize all the Species of *Flies* and *Beetles* of *England* alone, is the work of a Man's life.

The *Phalænæ* are so numerous, that should I live 20 Years longer, and were in condition to search them out, yet I should despair of coming to an end of

of them, much less of discovering the several changes they go through, from the *Egg* to the *Papilio*, and describing the *Erucae* and *Aureliae* of each.

I am of Opinion that the number of *Beetles* is equal to, if it doth not exceed that of *Papilios*, and they all undergo the like changes with them; of which I know no Man hath given us any tolerable Account.

The name of *Musca* I know not how far to extend, but if we make it to comprehend all the *dipterae*, then it will take in *Gnats* and *Tipulae*; and if them only, where shall we place the *Muscae Papilioniformes* and *Formiciformes*, &c.

I should refer all *flying Insects* with four membranaceous Wings, and a sting in their Tails, to the *Bee-kind*: But then I must draw under that Tribe the *Formicae*, which have Bodies too unlike.

The Work which I have now entred upon is indeed too great a Task for me; I am very crazy and infirm, and God knows whether I shall over-live this Winter. Cold Weather is very grievous to me; besides, I have not bestow'd sufficient time and pains in the quest of any Tribe of Insects, except *Papilio's*, and I have told how far short I am of perfection in that. I rely chiefly on Mr. *Willughby's* Discoveries, and the Contributions of Friends, Mr. *Petiver*, Mr. *Dandridge*, Dr. *Sloane*, Mr. *Morton*, Mr. *Stonestreet*. As for my own Papers on this Subject they are not worth the preserving; and Mr. *Willughby's* must be return'd to his Son Sir *Tho. Willughby*, from whom I had them, with promise to return them if I did not make use of them.

Black Notley, Sept. 6. 1704.

Mr.

Mr. Ray of the Number of Plants.

TO determine precisely what *Number of Plants* there are in the World, is a thing, if not absolutely, at least morally impossible, as we shall prove anon. But before we make any conjecture about their Number, it will be requisite to debate these two Questions. 1. Whether there have been or are yearly any new Species produced besides what were at first created? 2. Whether there have been, or may be any Species lost or destroyed? For if either of these be affirmed, in vain would it be to enquire the number of the Plants; it being uncertain, and variable every Year, and that possibly to a very great excess, or defect. For the causes of these Destructions and Productions being accidental, there is no reason why one should exactly, or in any near proportion, balance and compensate the other.

Of the first Question, those that hold the affirmative for proof of their Opinion, alledge common Experience: For doth not every new Year afford us new sorts of Flowers and Fruits? And consequently new sorts of Plants? Are not our Gardens and Orchards yearly enriched with new sorts, for Example, of *July Flowers*, *Tulips*, and *Anemonies*, of *Apples* and *Pears*? Do not our Gardeners sell us these for distinct Species? And do not Herbarists generally enumerate and describe them for such? What Herbal doth not make, for instance, *Caryophyllus*, or *Viola*, *Paralysis*, with a double Flower, different kinds from those with a single? I Answer, It is true, they do so; but if we examine and consider wherein their Differences consist, we shall find reason to doubt whether they be specifically distinct or no; nay rather

ther to conclude, they are not. First, as for *Flowers*. The main, if not only difference between these pretended new Species and the old, we shall find to consist either in the colour of the Flower, or the multiplicity of its Leaves. Now that neither of these is sufficient to infer a specifical Difference, is, I think, evident, unless we will admit that an *European*, and an *Ethiopian*, are two Species of Men, because one is black and the other white; or an *European* and an *Indian*, because the one hath a thick Beard, and the other none at all, or but a few straggling Hairs instead of it: The whole diversity being induced by the Climate, or Soil, or Nourishment, as in other Animals, is manifest. First, what effect the plenty and diversity of Food, and different manner of Living hath, appears in domestick Animals, *ex. gr.* *Swine*, *Ducks*, *Geese*, &c. which do frequently vary their Colours; whereas the *wild* of those kinds retain constantly the same; and not their Colours only, but the tastes of their Flesh, it requiring no very critical Palate to distinguish between the Flesh of *tame* and *wild* Beasts, or Fowl. As for the Colour, though wild Animals taken and brought up tame, do not usually themselves *in individuo* change their Colours, but after two or three Generations their Breed; yet sometimes they do, as I myself have seen a *Bull-finch*, which kept in a Cage, after some Years, from the usual Colour of that Bird, turn'd to be Cole black.

2. What influence the diversity of Soil and Climate hath upon divers Animals, as to the altering their Colour, and other Accidents, appears in divers Instances. From the difference of Climate, or constant inspection of Snow, it proceeds that in the *Alps* and other high Mountains, and also in those cold *Northern* Countries where the Earth, for more than half the Year, is continually cover'd with Snow, there are found many Animals white of those sorts, which are usually and naturally of another Colour; as for Ex-

ample, white *Bears*, white *Foxes*, white *Hares*, white *Ravens*, white *Black-birds*; and many others, as I myself have seen in *Italy*. That *Hares* upon the *Alps*, and in the cold *Northern Regions*, do in the Winter time, change their Colour to White, and in the Summer again return to their usual and natural Colour; though I find it deliver'd by good Authors, and attested by credible Persons, I dare not peremptorily assert: But that the influence of the Soil and Climate is great, appears farther in our *Lancashire* and *Sussex* Beasts; of which the former have fair, large, and well-spread Horns, the latter small and crooked; and if into *Sussex* you translate these Cattel out of *Lancashire*, their Race by degrees will degenerate, and come to the Shape of the Natives. So we see the *Horses* in *Flanders* have large and hairy Pasterns, which the *English* Breed have not: And it is reported for a Truth, that there is a Pasture upon a Hill call'd *Hasselbedge*, in the *Peak of Derbyshire*, near little *Hucklow*, which will turn the Hair of Kine that feed thereupon, to a grey Colour in three Years space. Now if diversity of Soil, Food, Climate, or other external Circumstances, breed such variety and difference among Animals of the same Species, much more then may it among Plants, which are less free in the choice of their Nourishment, and constantly affix'd to the Place where they chance to spring up.

Two ways there are of getting or producing these Differences. First, by sowing the Seed of that Plant, whereof you desire a new kind, in a rich Soil, or in a Soil different from its natural, or that where it grew before. So if you sow the Seed (for Example) of a *single July Flower* in good Ground, among many that bear single, it shall give you some Roots that bear double Flowers, and some of different Colours from their Mother Plant, which you may propagate by the slip. The Plants that are most apt to be thus diversified by sowing, are *July Flowers*; *Anemones*,
Lark-

Lark-spurs, Columbines, Bears-ears, Stocks, and Wall Flowers, Primroses and Cowslips, Crocuses, Blewbottles, Daisies, Hepaticas, Violets. And this is the usual, if not the only way, of getting double Flowers of all sorts. Most red and purple Flowers, and some yellow ones too, by sowing themselves in a Garden, will give you some of white and different Colours, as I found by my own Experience in many, v. g. *Valeriana rubra* Dod. *Mothmullein*, *Blewbottle*, *Primrose*, *Goats-rue*, &c. Nay in the Fields we find scarce any red, purple, or blew flower'd Plant, but one where or other it will vary, and come with a white or differently colour'd Flower. Plants that bear a yellow Flower seldom vary in the Fields. Secondly, the other way to diversify Plants, is by frequent removals. So Sir *Hugh Plat* tells us we may advance Plants from single to be double-flower'd, which seems probable; because Plants, by long standing in one place, will by degrees degenerate, and become of double single-flower'd, or turn from rare to common Colours. But because my trials of this kind succeeded not to produce such an effect, and I never yet met with any intelligent and credible Person who could attest it upon his own Experience, I shall leave it to farther Examination.

But to return to our Subject. That these varieties of Plants we have been discoursing of, are not to be accounted distinct Species, but only accidental Differences, may be farther confirmed; both because that if they stand long in the same Place without culture, they will (as we hinted before) degenerate, losing the beauty of their Colours, and of double becoming single; and also because that by the Seed they will not propagate their Species, but give you single Plants, and of the common Colour; I mean if they be sown in their proper natural Place and Soil. The only sure way to propagate them being by *offsets* from the Root, if they be *bulbous* Plants; or by

slips and *branches*, if others. To this I might add, that from the same stem of a *Stock July Flower*, I have sometimes seen some *Branches* bearing double, others single *Flowers*. By the by, let me note, that I have by Experience found the vulgar mistaken in that Opinion current among them, that the Seed of those *Flowers* which have more than the usual and just number of *Leaves*, will produce *Plants* bearing double *Flowers*; for from the Seed of the *Stock July Flower*, succeeding *Flowers* that were of five and six *Leaves* apiece (whereas the usual number in that *Plant* is but four) I had not one double flower'd *Plant* sprung.

Secondly, as for *Fruit-trees*, we may observe that the main difference between these pretended distinct *Species*, consists in the figure and taste of the *Fruit*, or *Pericarpium*; which accidents are also wholly to be attributed to the difference of the *Soil*, and the various ways of *Infection*. For the means, and I suspect the only means, to get new *Fruits*, is by sowing the *Seeds* or *Kernels* of *Apples* and *Pears* in good *Ground*, which will give you *wildings* of a different figure and taste from their mother *Fruits*, whose tastes may be mended and improv'd by *Infection*. But that by *Infection* new sorts of *Pears* or *Apples* (I mean different both as to figure, colour, magnitude and taste) may be produced, is to me scarce credible; because I have hitherto embraced for an universal and undoubted Maxim, That *the Fruit follows the Cyon*.

As for *Plants* of *striped* or *variegated Leaves*, viz. *gilded Box*, *Holly*, *Alaternus*, *Rosemary*, *Bittersweet*, *Mugwort*, *Hyssop*, *Mint*, *Thyme*, &c. there is less reason to allow them to be different *Species*, than either the forementioned *Flowers* and *Fruits*; because that by several applications to the *Roots* of those *Plants*, they may be so alter'd from the ordinary Colours: These Marks being but the symptoms of a morbid Constitution of the *Plant*, induced by the fore-said applications. And, as we observed in *Flowers*,
the

the Seed will give you a Plant void of those Marks, which are propagated in the Slip or Branch.

I am not ignorant that some do make the differences of *great* and *little* singly, to be sufficient notes whereon to ground a distinction of Species. So in *Parkinson* and *Gerard's Herbars*, we find many Plants put down for distinct Species, which the Authors themselves confess to differ in no other point, than in being in all parts less the one than the other. Now though I grant there are certain bounds and measures of littleness, and greatness, which both Plants and Animals cannot exceed or fall short of: As for Example, a *Sheep* will never come to be so big as an *Elephant*, nor so little as a *Mouse*; nor a *Goose-berry-bush* so tall as an *Oak*, or so low and small as *Adiantum aureum minus*, when grown to its stature, be it in what Countrey you please; yet is there a very great Latitude in this particular between many Plants of the same Species, the difference of ten, nay twenty to one being only in magnitude: Which difference is yet wholly to be imputed either to the richness or poverty of the Soil, the moistness or drought of the Season, the coldness or heat of the Climate, or some other Accident; which is evident in that if you take the Seed of the smallest and poorest Plant in its kind, provided it will admit culture; and sow it in a rich Soil well water'd, you shall soon get an Offspring ten times as great as their mother Plants. Nay take a root of a perennial, and removable Plant, from off a cold barren Mountain, and plant it in a fat warm Garden, and it shall attain twice the stature or dimensions it would have gotten, had it remained in its native Place. The like is observed in Animals, we having here in *England* of *Sheep*, from five to fifty Pound a Score; and of Beasts, from three to twenty Pound apiece. This is all I have to say to the first Question.

350 *Mr. Ray of the Number of Plants.*

The second Question is, *Whether there have been, or may be, any Species lost or destroyed?* To which I Answer, 1. That though it is absolutely, and physically possible, yet it is highly improbable, that any Species should be lost. 2. Though some Species should be destroyed, yet it is impossible morally that any Man should be sure thereof. First I say that it is highly improbable, because that I can hardly persuade my self that there is any one local Species of Plants in the World; I mean so proper and peculiar to one individual Place as not to be found elsewhere. I am induced so to think, because I have not observed in *England* any one Plant so proper to one Place, but that I have found the same either beyond Sea, or at least in several Places of this Island; and I doubt not but whatever grows naturally here may be found in divers Places of the same Latitude, or Temper, beyond the Seas. I am not ignorant that Herbarists make sundry Plants proper and particular to some one Place. As for Example, the *Balsam* to *Judæa*, &c. But from these I must crave leave to dissent, till they have more than a negative Argument to prove what they affirm. Yet supposing there be such *local Plants* (unless you place them in Islands that shall be wholly overwhelmed and swallowed up by the Sea) though they were at present utterly extirpated by the Hand of Man, or any Accident, yet the Seed, or at least seminal Tinctures remaining in their original and native Soil, when the present obstruction is removed, the Earth will be apt to put forth the same Plant again; so that if *Balsam* were at first native of *Judæa*, and not imported from abroad, though it were all translated into *Egypt*, or elsewhere, I am persuaded the natural Earth would have again produced it, unless the Temper of it were much altered by some accidental or supernatural Cause. Secondly, tho' some Species should be destroyed, it is morally impossible that any Man should be sure thereof. For first,

no Man can be sure that there is any one *local Plant* in the World, unless either he himself hath visited every little spot of the whole Earth, or have information from intelligent Persons, that know all Plants, in all Countries, both which are utterly impossible: But if there be no *local Plants*, as I am confidently persuaded there are not, then it is next to impossible that Causes should concur to destroy any one Species out of the World; or if they did, that any Man in so vast a Place as the Earth is, so great a part of it also Desert, or inhabited by barbarous Nations who mind not these things, should ever get Advice, or come to the knowledge of it.

In a Paper of Tho. Willisel's he names these following Trees on which he found Mistletoe growing, viz.

O A K.
Ash.
Lime-Tree.
Elm.
Hazel.
Willow.
White Beam.
Purging Thorn.
Quicken-Tree.
Apple-Tree.
Crab-Tree.
White-Thorn.

Mr. Fr. Willughby's Observations on divers Animals, as I found them scatter'd among Mr. Ray's Papers, and are not publish'd elsewhere.

1. Of ROOKS.

THEY fight often, and he that gets the better throws down the other's Nest. One of them always stays at home and tends the Nest.

2. Of the BUZZARD.

A Cock-Buzzard breeds the young ones if the Hen be killed. Three Buzzards have been killed from the same Nest.

3. Of the Fat of BEASTS.

Vaccis, ovibus & omnibus Ruminantibus, Adeps durior est, quàm Porcis, Equis, Canibus, &c. Hinc ossa Equorum & Porcorum fracta, difficillimè cohærent.

4. Of the Garge, or Garget in SWINE.

This Distemper makes them first hoarse, then leave their Meat. When they are dead, they have great red Spots upon their Legs and Bellies. Within their Bodies the Liver and Spleen are softer than ordinary, and easily broken, with much coagulated Blood about the Spleen; but especially the Lungs are
very

very rotten, and stuffed with a white, purulent Matter, which is the Cause of their Hoarseness.

In other Hogs that died of this Disease, the Liver grew to the Midriff, and the Lungs were free from that purulent Matter.

To prevent this Distemper, they make a long Hole under the Skin, about the middle of the outside of the Ear, and thrust therein a little Bit of *Hellebore Root* sharpened. [In *Essex* they do it on the Inside of the Ear, and thrust in a small piece of the Stalk of *Bears-foot*, or the *Black Hellebore* doubled, which will eat an Hole through the Ear, and make it run a Pus in a large Quantity, like an Issue.]

5. Of the B A T.

Verspertilionem, penis & testes magni: *Vesica* ut in quadrupedibus: *Renes* magni; sinister major, & podici propior: *Jecur* magnum non dextro latere sed medio situm: *Costæ* 11 aut 12 *Diaphragma* ut in quadrupedibus: *Intestina* cæca nulla: *Pulmones* ut in quadr. scil. non costis fixi: *Dentes caninos* habet: *Molares* acutiores quàm in aliis: inter caninos superiores incisores sunt numero sex; inter inferiores octo: in medio inter superiores incisores *Lobus* carneus.

Avibus convenit, 1. Sterno, 2. Positione Hepatis: Cum quadrupedibus, 1. Renibus, 2. Vesicâ, 3. Dentibus, 4. Pene & testiculis, 5. Diaphragmate, 6. Pulmonibus.

6. Of the H A R E.

Leporibus mammæ per totam ventris longitudinem extenduntur, incipientes à sterni fere principio, desinentes non procul ab ossè pubis; papillæ 3 in utroque latere; quarum una medio fere ventris, extremarum una juxta anteriorem pedem altera juxta posteriorem.

Anatomia Leporis Gravidæ.

1. Juxta podicem 2 glandulæ foetidæ: in quarum mediis foramina seu vasa excretoria, materiâ nigrâ.

2. Cellulæ ex unâ tantum coli parte.

3. Ligamenta rotundis ligamentis Fœminarum analoga.

4. Clitoris ingens, & peni similis, duobus auribus ossi pubis affixa.

5. Collum uteri longum, ita ut impossibile est in hoc, & multis aliis animalibus ut penis extremitas ad os uteri pertingeret.

6. A collo uteri non unus tantum meatus in uterum, ut in multis, sed duo; unus à quolibet cornu. Hinc superfoetationis causa, uno cornu semen accipiente unâ vice, & altero alterâ. Hoc unum cornu Fœtu gravidum erat: Alterum nuperæ exclusionis signa manifesta habuit.

7. Placenta uteri ingens & unica, sed eâ parte quâ utero adhærebat, albida; eâ quâ membranis Fœtûs sanguinea. Pars albida à sanguineâ facilè erat separabilis.

8. Inflatis uteri cornibus aer nullâ vi in vasa deferentiâ intrudi potuit. Contrâ facillimè per deferentia in uterum: ut & semen albidum quo turgida erant deferentia.

9. Umbilicalia sex: duo mesenterica: duo arteriæ: 1 Vena & Urachus.

10. Fœtûs Ventriculus limpidâ aquâ plenus, qualis in Amnio reperiri solet. Prima membrana, Chorion, undique vasis conspersa. Q. an in 2 partes discidi possit in centro? Majores rami ex multis minoribus conflati: Umbilicalibus juncta postea Mesenterica sunt. Hæc pulcherrimè apparent, si membrana infletur. Sub hâc Amnium quo natat fœtus: dein alia tunica, quâ Umbilicalia à Placentâ suspenditur; quâ etiam humor. An Allantoides? An 3 distincti humores. An ex hâc Allantoide in Vesicam humor, & postea in Amnium transire potest? An ulla vasa è Placentâ ad Chorion & Mesenterica.

An



A N

APPENDIX

TO THE

Foregoing PAPERS.

CONTAINING

LETTERS *written to* Fr. Willughby
Esq; by Mr. Ray, *and other learned*
Men.

Mr. Ray to Fr. Willughby Esq;

S I R,



HAVE herewithal sent you one of my Books, which you had receiv'd a Week sooner, had not the Book-binder deceived me. I need say nothing either to commend or disparage it; you know what it is as well as my self. Since I fully dispatch'd it, one or two other Designs came into my Head,

Z z 2

which

which you being concerned in, (I mean in my Intentions) I shall communicate to you, and desire first your Sentence and Opinion concerning the whole; and then in case of Approbation, your particular Directions as to the Management and carrying on. You remember that we lately, out of *Gerard*, *Parkinson*, and *Phytologia Britannica*, made a Collection of rare Plants, whose Places are therein mentioned, and ranked them under the several Counties. My Intention now is to carry on and perfect that Design; to which Purpose I am now writing to all my Friends and Acquaintance who are skilful in Herbarry, to request them this next Summer each to search diligently his Countrey for Plants, and to send me a Catalogue of such as they find, together with the Places where they grow. In divers Counties I have such as are skilful and industrious. For *Warwickshire* and *Nottinghamshire* I must beg your Assistance, which I hope, and am confident, you will be willing to contribute. After that, partly by my own Search, partly by the mention'd Assistance, I shall have got as much Information and Knowledge of the Plants of each Countrey as I can, (which will require some Years) I do design to put forth a compleat P. B. which I hope to bring into as narrow a Compass as this Book. First I shall give the Names of all Plants that are or shall then be found growing in *England* in an Alphabetical Order; together with their *Synonyma*, excepting such as are mention'd in this Catalogue, whose *Synonyma* I shall omit, setting down only one Name, and referring for the rest to *Cat. Cant.* I shall also put a full *Index Anglicolatinus* after the Manner of that in this Catalogue. Then I shall put in the Counties, with the several rare Plants in them marshalled alphabetically. Instead of putting the particular Places to each Plant in the first Catalogue, I shall only refer to this: As suppose at *Sedum Tridactylites Alpinum*, after I have given the several *Synonyma*, and the *English Name*; instead of
adding

adding the Place, I will say *Vide Carnarvonshire, &c.* My second Design is to make another Catalogue, which I will call *Horti Angliæ*. I intend to write to all the noted Gardens to procure a Catalogue of each; *Oxford* Garden and *Tradescants* I have already. Then I shall out of my own Garden; and all these make up one Catalogue. Herein I shall give the *Synonyma* of each Plant; and those that are not in my Garden, I shall name in what Places they are; as suppose *Olea Sativa*, after I have put down his *Synonyma* and *English Name*, I shall add *Tradescants Garden*, and so of the rest. Into this Catalogue I shall not admit any that grow wild in *England*, lest it swell too big. To this also I shall add a compleat *Index Anglicolatinus*. You have my Designs, and I desire your Judgment of them. I would not be flattered, I am not so fond of my own Conceits: If prudent Men think they will be of no use to the Publick, I am not so foolish to trouble my self and Friends to no End but to trouble others. I shall be very glad, Sir, to hear from you; and as I have heretofore received abundance of Pleasure and Contentment from your Friendship and Society, so would it still be some Comfort to me to know that I retain a Place in your Thoughts and Esteem, though the meanest. I am, &c.

Coll. Trin. Feb. 25. 1659.

Mr. Courthope to Fr. Willughby Esq;

S I R,

Constantinus Rodocanasis salutes you. Yesterday he brought his Materials into the Combination, and shew'd the *Experiment* of the *Tree*, which suddenly arose, and within less than an hour reached the top

358 *Mr. Courthope to Mr. Willughby.*

top of the Liquor: *Man* especially was of a quick Growth, which sent forth a long Shoot above the Liquor, which was much bigger at the the top than the bottom, that the Weight of it brake it off. The Reason it did not succeed with us in so short a time, was only because the *Metals* were not put into the Liquor as soon as they were evaporated. This Morning he was at my Chamber, and gave me a Taste of a *Tincture* of *Antimony*, which had no Acrimony at all, yet deep and strong, which he prizes much: He only told me it was prepared of the *Glass* of *Antim.* but how I know not yet.

Trin. Coll. Camb. March 17. 1659.

Mr. Ray to Mr. Willisel.

S I R,

ON *Saturday* Night last, the 7th Instant, Mr. *Skippon* and my self arrived at *Cambridge* from a long *Northern* Expedition; wherein for the most part we followed your Footsteps, proceeding just so far as *Sterling*, and returning by *Glasgow*. I gave you in a former Letter an account of our Design and Intention, which whether you received or not I know not. In all this Journey I met with but four Plants which I had not formerly observed, and in *Scotland* not one. Those are *Pneumonanthe*, which hath a beautiful blew Flower, and is perpetual: It grows plentifully in many heathy and moist Grounds in *Lincolnshire*, and the *Eastern* side of *Yorkshire*, and Flowers about the latter end of *August*. *Sedi Alpini parva Species*, which I have not yet searched out. It hath a yellow Flower, and flowers about the beginning of *August*. This I found only in one small spot of Ground about *Shap* in *Westmorland*. *Chrysanthemum majus folio valde laciniato,*

*cinia*to, flore croceo. J. B. as I judge. This I found in a Bank near to the River Tees, in the Bishoprick of Durham. *Lapathum folio acuto flore aureo*. C. B. which I had before taken some notice of, when I was less careful and curious in distinguishing of Plants. I found likewise near Huntingdon a Plant which the the last Year I observed not far from St. Neot's coming to wait upon you, which puzzles me fore. It's between a *Grass* and a *Caryophyllus*, I know not what to call it, unless it be *Polygono angustissimo folio affinis* C. B. but I cannot find that described any where. I have sent you a little Branch of it for your Judgment about it. The seed Vessel is large, and perfectly to be seen. The Flower is a very small yellowish one. You mention a *Box* which you intend for all sorts of *Fruits* and *Seeds*. It must have almost infinite Cells and Divisions to contain all the varieties of *Seeds* and *Fruits*. Concerning the Order and Method of it you need not my Advice, for I can give you none but what is very obvious, viz. to put those of the same Tribe near together. As for Instance, to have a *Drawer* with several Cells or Boxes for *Nuts*, another for *Cones*, &c. for the rest of *Fruits* which may be reduced to several Heads; and then one for *Exoticks*, which cannot be conveniently referred. In like manner for *Herbs*, to have a *Drawer* with several Boxes or Divisions for *Legumina*, another the like for *Cerealia*, &c. only those Boxes must be more numerous than those for *Fruits*. By a *Drawer* with several *Boxes*, I mean such a thing as the Printers put their Letters in. There hath been, and still continues to be here, an *epidemical Sickness*, in the nature of a *Fever*; which cuts off many old Persons and Children, but those of middle Age it spares. Some of my small Company are grievously affected with it. In the North of England, and in Scotland, we heard of no such thing.

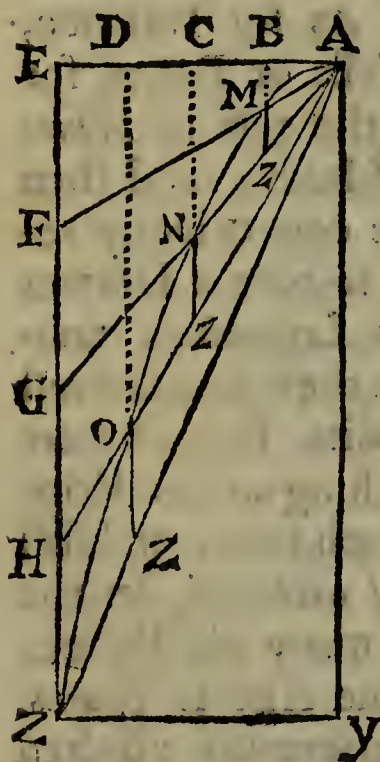
Coll. Trin. Sept. 14. 1661.

Mr.

Mr. Barrow to Mr. Willughby.

Most dearly Honoured Sir,

YOUR Observation concerning the *spiral Line*, sufficiently evinces the invalidity of that demonstration concerning its *equality with the Semi-periphery*; but to remove all doubt, 'tis said that *Mons. Robervell* hath demonstrated that the *spiral Line* is equal to the *parabolical Line* AMNOZ, whose Axis AY is equal to the semi-periphery, and YZ (ordinately apply'd) equal to the Radius. I have not time and space to present you my Thoughts concerning the Business; only supposing EZ parallel to AY be divided into equal parts, EF, FG, GH, HZ; and AE into as many equal Parts, and through the points of the division of EF from Vertex A be drawn Lines AF, AG, AH, AZ; and through the points of the division of AE, parallels BZ, CZ, DZ, &c. to AY. The intersections M, N, O, Z, are in the parabolical Line; (as appears by the 5th of *Archim. de Quadra. Parabolæ*) and MZ, NZ, OZ, HZ are in Arithmetical proportion, as the Arches of Circles inscribed in the Spiral; from whence appears the great Analogy between these two Lines, &c. which I leave to your Consideration. Upon occasion of Lectures I intend upon *Archim. de Equipond.* I have had several Thoughts about these Matters, which I should be glad to communicate with you.



Trin. Col. March 26. 1662.

Mr.

Mr. Skippen to Mr. Willughby.

S I R,

Messina, June 5, S. V. 1664.

SINCE we left you and Mr. Bacon at Naples, we have seen Messina and Malta: At Messina we visited Dr. Petrus Corvinus, Nephew to Dr. Petrus Castellus, who left the MS. about *Insects*; the Nephew shewed it to us, and told us he wish'd it printed, but confess'd himself not in a Capacity; and besides, declared his Resolution not to part with the Original, yet offer'd free liberty to any one that would spend his time in transcribing it; which we thought would be too great a Labour, the MS. consisting of two large 4^{to}'s. Then we asked him if he would venture it into a Foreign Countrey on good Security, which he seemed to listen to; but fear he will set too great a Sum that must be engaged for the safe return of the Original into his Hands. You may give what Information you please to those at London, and if they think it worth their Charge, they may have converse with the Dr. by the means of some *English* Merchants in Messina, who do all understand that Affair; their Names are, Mr. Nich. Mead, Mr. Jonathan Parker, Mr. Lawrence Trelle, and Mr. Martin Wilkinson. The enclosed Paper discovers the Design of the MS. and very probably the Contents answer their Titles; the short view we had of it gave us satisfaction enough that it deserves the publishing. It is fairly written, and the *Insects* painted by Castellus's own Hand.

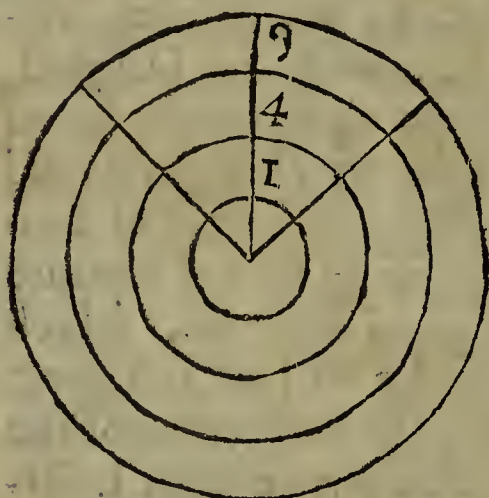
P. S. Something to this Purpose I have mention'd to Mr. Horsnell, lest this should miscarry,

Dr. Barrow to Mr. Willughby.

Most Honoured Sir,

Trin. Col. Oct. 5. 1665.

YOUR Discourse inferring the *Solidity of the Sphere* from the *Surface*, by comparing the *Concentrical Surfaces* of the Sphere with the *Parallel Circles of the Cone*, is very ingenious and solid. I did formerly use somewhat a like Method, thus:



Dividing the Radius into equal Parts indefinitely, and suposing equal Surfaces concentrical through the Divisions, they will proceed increasing as the Squares of their Radii ('tis the Property of all like Surfaces) that is as 1, 4, 9, &c. Wherefore if the greatest be S , the Sum of all will

be $\frac{rS}{3} = \text{Sphere}$, and if $S = 4$ greater Circles $= 2rp$.

the Sphere will be $\frac{2}{3} rrp$. but rrp is a Cyindre, whose Basis rp , altitude $2r$. By the same Method

you may find the Solidity of a Spherical Sector, supposing its Spherical Superficies known, and consequently of the Portion it contains.

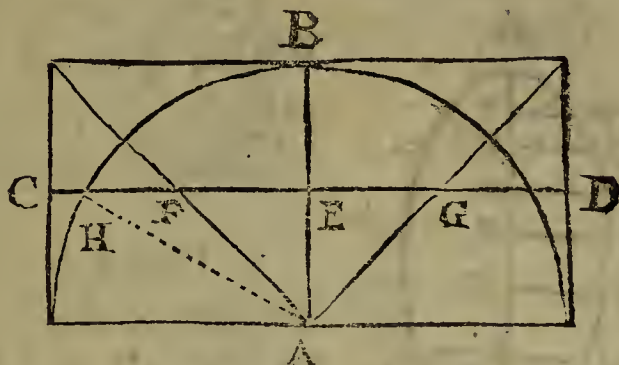
r . est Radius.

p . est Peripheria.

Your

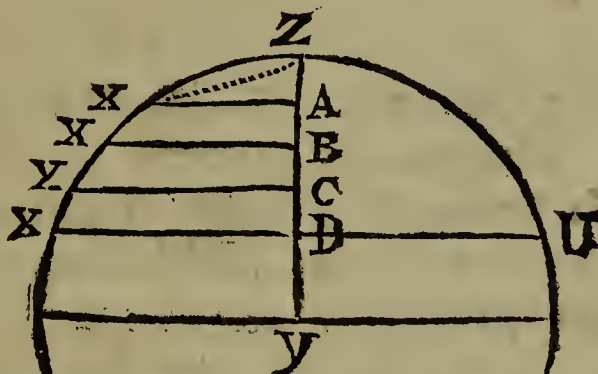
Your Observation concerning the *Equality of the Annuli with Spherical Portions* is also true, and ingeniously proved, but may be more briefly by plain Indivisibles; thus. Cir-

culus radio HE æquatur circulo, cujus radius AH minus circulo cujus radius AE, vel EF. Item annulus ex circumductâ CF æquatur circulo cujus radius EC (vel AH) minus circulo cujus radius EF. ac sic ubique; ergo, &c.



As to your last thing, driving as I understand to the finding of a *Spherical Portion by Indivisibles*, the shortest and clearest way of satisfying that Attempt is I think this.

Call $ZA = 1. ZB = 2a. ZC = 3a.$
 &c. $ZD = n. ZXq = da.$
 $AXq = 1a - da.$
 $BXq = 2da - 4aa.$
 $CXq = 3da - 9aa.$
 $DXq = dn - nn.$



Summ. $\frac{dnn}{2} - \frac{n^3}{3}$. est summa quadratorum ex radiis.

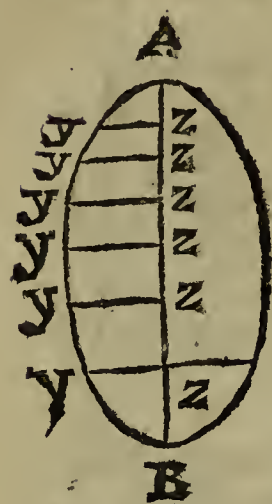
rr. $\frac{rp}{2} :: \frac{dnn}{2} - \frac{n^3}{3} \frac{np}{2} - \frac{n^3p}{3d}$. ergo $\frac{np}{2} - \frac{n^3p}{3d}$

hoc est Cylindrus
 base np , alt. $\frac{n}{2} - \frac{nn}{3d}$

} Est portio XZU.

364 Dr. Barrow to Mr. Willughby.

As to the Lines *en perle*, having no time to think more, I will exscribe what I writ hastily in a Paper-Book when I read *Detonville*.



Mentionem facit Detonvilius de Perlis; quas D. Slusius in ordines disposuit. De illis quid sit nescio, sed tales fuisse conjicio.

1. Dividatur AB æqualiter in Z, & habeant se ordinatæ ZY sicut AZ \times ZB ubique: ut si AB = r, & AZ = a, 2a, 3a, &c. fit ordo; 0, ra—aa, 2ra—4aa, 3ra—9aa, &c.

2. Habeant sese ZY ut AZq \times ZB; ut fit talis series

$$\left\{ \begin{array}{l} 1raa—a^3 \\ 4raa—8a^3 \\ 9raa—27a^3 \text{ \&c.} \end{array} \right.$$

3. Series 0, ra³—a⁴, 8ra³—16a⁴, 27ra³—81a⁴, &c.

Maxima ordinatarum prout augetur dimensionum numerus, eo propius accedit ad B, hinc *Perlæ* nomen, ex figuræ similitudine. Hæc memoriæ causâ; quæ poliantur.

As for your *Statical Question*, I remember not to have read concerning it, and Mathematicians generally suppose the contrary, or that in all Postures *equal Weights at equal Distances do equiponderate*: The Effect perhaps may depend on Causes barely Physical. I have no Leisure to write about it now, yet I will propound one Answer, tho' perhaps little satisfactory, (and which indeed does not please my self.)

Let

Bishop Wilkins to Mr. Willughby.

S I R,

Oct. 20. 1666.

I Venture this Letter not without some doubt whether it be like to find you at home or not. I thought it fitting to inform you, that the late Fire hath destroyed all the Impression that was wrought off, *viz.* 42 Sheets of the Book I was printing^a, excepting only one Copy of each Sheet, which was sent to me from the Press, which I had with me in the Countrey, besides the written Copy of the whole second Book, and the Dictionary from the beginning of the Letter *R*, which I had likewise sent entire to the Press; the renewing of which will be no small Trouble and Difficulty to me. But I am not hereby discouraged from the Thoughts of beginning again: Only, before I set about it, I must desire your best Assistance for the regular Enumeration and defining of the Families of Plants and Animals. I thought to have found great Benefit in this Kind by Dr. *Merret's* late Book, but it hath not answer'd my Expectation; nor do I know any Person in this Nation who is so well able to assist in such Matters as yourself, especially if we could procure Mr. *Ray's* Company to join in it. I would fain know whether you are like to come up to Town for any Time this Winter, and when, that I may farther consult with you here: If not, I would be willing to wait upon you in the Countrey, where I suppose you have all the Books necessary for such Enquiries; but then I would earnestly desire that we might have Mr. *Ray's* Company and Help, if you can contrive it. If I could fully satisfy my self in the methodical Enumeration of such things, I would put out the next Edition in *Folio*, with handsome Cuts of all such things as are fit

^a *This Book was his Real Character.*

to be represented in Figure. If you can afford me any of your Time at present for the digesting of these Matters, I will get what I have done transcrib'd, and sent down to you, that you may add to, or alter it as you think fit. I hope at your next Opportunity to hear from you. I am, &c.

Mr. Jessop to Mr. Willughby.

S I R,

I Have packed up the Skins in a Box. There is the two *Moorgame*, a Cock and an Hen; the Cock is pretty perfect, but the Hen hath a Wing shot off. There is also a Bird that I take for a *Bernacle*, a *Colymbus major*, and an *horned Owl*, with a *black-legg'd Linet* in a little Paper; a Friend of mine kept it in a Cage till it dy'd; and so it lay neglected, till I found it by chance dried, as you have it. Altho' it be something like the ordinary Kind, yet they differ in Bigness, (this being less;) but much more in Voice, this singing more shrilly, and with a harsher Tone than the ordinary one. The Beak also in some that I have seen alive is much greener than you see it in this. The *Moor-cock* is certainly none of the *Gallina Corylorum*; and whether it be the *Grygallus* which *Gesner* describes, I also doubt, having compared these with both his Cut and Description: It agrees with it in many Particulars, but differs from it in some. The Feet are not like those of the *Urogallus minor*, but nearer resembling those of the *Lagopus*, being feather'd all over. The *Vestitrices* also wholly cover the Tail, contrary to his Cut, which he pretends to be very exact, as being taken from a live Bird, which was brought him. The rest of his Description may agree with this, and for ought I know
many

many other Birds, being so general as it is; and the Cut doth something resemble it, altho' not exactly.

I have been labouring all this Day to send you the Problem you speak of, but find it too long and difficult to dispatch it so soon; for I had committed very little of it to writing, and am not so confident of the Success of it, that I dare send it thus imperfect; there being a great many Propositions to be demonstrated before I can come to the thing I aim at. All that I can certainly promise is this, altho' I have been a little more bold than wise.

Si conus rectus secetur à plano axi parallelo, & demittantur duæ rectæ à vertice ejusdem coni, ad terminos basis hyperbolæ per eam sectionem factæ, invenire quadratum æquale superficiei conicæ à lineâ hyperbolicâ & iisdem rectis terminatæ. And after this to find a conical Superficies equal to an Hyperbole, which shall cut the Axis of a Cone; and another conical Superficies (all of them something after the same Manner) equal to a Triangle, less by an Hyperbole. And I fancy that I have found out the *Ratio* that some of these several Sorts of conical Superficies have one to another. Whether these things are ordinary or no, I know not: But however the main Design succeed, I find this, which is a little surprizing unto one who is not much versed in these Matters, that it is possible to find a plain Figure equal to any Part of the Superficies of a Cone cut off after any manner by Planes: It is also possible a plane Figure being given, however terminated after any manner by those ordinary Lines used by Geometricians, to find a Part of the Superficies of a Cone equal to it. You may also find in a Cone cut by an *Ellipsis* an *Ungula*, to which you may find a *Pyramide* equal, as well as in the Cylinder, besides a great many other Portions of a Cone, to which the like may be done more easily; but that which I most take notice of is this, *viz.*

Sir

Si datæ hyperbolæ inveniri potest circulus æqualis, possibile est exhibere quadratum æquale tam datæ hyperbolæ quàm circulo.

Mr. Ray to Mr. Willughby.

D. Francisco Willughby J. Wray. S. D.

DE mirâ plantarum è semine enatarum metamorphosi, & evariatione à nativâ matrum figurâ, nè dicam Specie, tum *Robertus* junior, tum *D. Brown* experimenta aliquot à se facta mihi retulerunt; adeò ut jam penè persuasus sim plantas degenerare posse & intra latitudinem generis seu tribûs suæ speciem mutare. De *Nymphæâ albâ* & *luteâ minoribus*, jam planè despero, nihil ejusmodi à se unquam visum in fluviis circa aut propè *Oxonium* affirmat *D. Brown*. Semina nulla collegi, nec enim præter *Croci* ulla tum maturuerunt. *Croci* semen in hortulo *D. Brown* non antea à me conspectum copiosum vidi, sed nescio quâ incogitantia illud omisi & neglexi. Die Lunæ *Cawshamum* vicum uno circiter milliari *Readingâ* remotum perrexi, illinc non longè in colle cretaceo qui *Thamesi* imminet *Orchin anthropophoron* ex instinctu *D. Brown* inveni, non tamen copiosè. Eandemmet pridem circa *Genevam* inveneram; *J. Bauhino* *Orchis galeâ* & alis ferè cinereis dicitur. Et hic, quod ad plantas spontaneas attinet, solus hujus itineris fructus erat. Die Martis huc veni ubi brevi unius diei quiete interpositâ ut *Morgani* hortum lustrarem. Die Jovis pedes in *Cantium* progressus sum usq; ad collem *Rough-bill* dictum, à *Darfordiâ* non longè, ut ibi invenirem *Helleborinen albam* & *Florem Adonidis*, quas se illic loci invenisse *T. Willisellus* asseruit. Sed quamvis non indiligens scrutinium adhibuerim, neutra mihi conspecta est.

At neq; quicquam de *Flore Adonidis* in arvis illis crescente, à rusticâ turbâ quam sciscitabar, inaudire potui. Inveni quidem *Chamæpityn* & *Persoliatam* copiosè, & præterea novam *Gerani* *Columbini* foliis magis dissectis speciem, quam à se in agris collectam cùm *Oxonii* essem mihi monstravit *Jacobus Bobertus* filius.

Mr. Oldenburgh to Mr. Willughby.

S I R,

London, May 17—70.

I Have received from *Dr. Long* an account of the *Spider and Toad-duel*, which I am engaged by promise to impart to you; which I shall do in his own Words, viz.

I resolved this Day (May 10.) to have taken one of the Spectators of the Combat betwixt the Toad and Spider, fought at Hetcorne near Sittinghurst in Kent, and to have made him go along with me to the place of Battel; and there, after a punctual examination of all Circumstances, to have taken up a Spider of the same Kind or Species, and the same bigness, and sent two of them inclosed in a pair of Walnut-shells, one for Mr. Willughby, and the other for your self: But some Affairs of the two Neighbour-parishes, and other indispensable Occasions debarr'd me from the opportunity of giving you the satisfaction according to my desire, till the next Carrier. And I find not by my Enquiry and Observation, that the common black Field-spiders (for such are these Aggressors) are any of them as yet of sufficient Bulk and Strength to encounter a great Toad: For she must be near as big as the end of a Man's Thumb, and have not only her Body fully fraught with Poyson, but the extreme part thereof hoary (white); whether with Age or Poyson, the relators are not competent Judges; but
suppose

suppose it to be with Poyson, because, after the Combat, when she went away lank and empty of her Poyson, her whiteness also disappear'd. The latter end of May is the right Season for such Spiders, and it seems to me not only a rhetorical Flourish, but a philosophical Truth, that the same May-flowers-dew fills the Spider with Poyson, and the Bee with Honey.

To this the same Dr. adds these Particulars.

I brought home (saith he) Yesterday many hundred seedling Beeches in my Glove, and planted them, where they grow very kindly; and this Day many more seeds of Elm (a rare Timber in this part of Kent). But what Trees are those, Sir, I also brought home by hundreds in a small Basket, and planted on Saturday last in my Nursery, which bear ripe sweet Nuts at or under six Months growth? And of those Nuts some are so large, that half the weight of it is borne up on high by one Tree, and the other half by another, and appears a sufficient load to them both. And what Fruit or Seed is that, and of what Tree, which being set or sown at Michaelmas, and having lain in the Earth till now, and shot out from it two fair Trees, is as sound, entire and sweet, as the Barley-Grain when malted and gently dried in the Sun? And if you know what it is, why may it not be malted and brew'd, the Spirits of it being so quick and Balsamick, that it not only recovers the life of dead Barley-drink, but prolongs it when recover'd; which the Chymical Balsamick Oil of Sulphur cannot so perform.

So far he. This I thought fit to communicate to you, and shall be very glad to receive your Thoughts on all.

*In another Letter of Mr. Oldenburgh to
Mr. Willoughby, of Aug. 5. 1670.*

I Find this Observation from Dr. Tonge, That he
hath found by Experience, Toad's Piss to be so hot,
that it will scorch a Glove whereon it falleth, as a live
Coal would do if laid thereon.



The last LETTER which Mr. Ray wrote, which was to Sir Hans Sloane, and bears the Marks of a dying Hand in every Letter.

Dear Sir,

THE best of Friends: These are to take a final Leave of you as to this World. I look upon my self as a Dying-Man. God requite your Kindness expressed any ways towards me an Hundred-Fold: Bless you with a Confluence of all good things in this World, and eternal Life and Happiness hereafter. Grant us an happy meeting in Heaven. I am,

S I R,

Black-Notley,
Jan. 7. 1704.

Eternally Yours,

JOHN RAY.

POSTSCRIPT.

When you happen to write to my singular Friend Dr. *Hotton*, I pray tell him I received his most obliging and affectionate Letter, for which I return Thanks, and acquaint him that I was not able to answer it; or——*His Strength failing, as I perceive by his writing, (which was scarce legible in this Postscript) he was forced to break off abruptly.*

Mr.

Mr. Ray's Dying-Words, and Behaviour, before the Reverend Mr. Pyke, Rector of Black-Notley, and Prebendary of Norwich.

I Am a Priest of the Church of *England*, ordained by *Dr. Sanderson*, then *Bishop of Lincoln*. That I did not follow the peculiar Duties of my Function more, is now the greatest Concern and Trouble to me. I do here profess, that as I have lived, so I desire, and, by the Grace of God, resolve to die in the Communion of the Catholick Church of Christ, and a true, tho' unworthy Son of the Church by Law establish'd in this Kingdom. I do think, from the bottom of my Heart, that its *Doctrine is pure*, its *Worship decent*, and agreeable to the word of God; and in the most material Points of both conformable to the Faith and Practice of the godly Churches of Christ in the Primitive and Purer Times. I am not led to this Persuasion so much from force of Custom and Education, as upon the clear evidence of Truth and Reason. And after a serious and impartial Examination of the Grounds thereof, I am fully persuaded, that the Scruples Men raise against joining in Communion with it, are unreasonable and groundless; and that the Separation which is made may very justly be charged upon the Dissenters themselves, as the blame-worthy Authors of it.

He then desired me to read to him the Prayers of the Church, which in the Visitation of the Sick are appointed to be used by us; and the *Absolution* in particular he requested me to read: Which I having pronounced to such a true Penitent, Devout and

Humble

Humble Soul, I could not but have these comfortable Thoughts, that what was thus declared remitted upon Earth, would be remitted in Heaven also.

After this I gave him the Sacrament of the Lord's Supper, which as it is Men's Duty often to receive in the time of Health, so at the Hour of Death, he said, it was a necessary *Viaticum* he thought for the great Journey he was now a going.

Note concerning Kermes and Vegetable Excrescences, Pag. 109, 116, 152.

I Have with great Care endeavoured to hatch the *Kermes*, and most of the *Vegetable Excrescences* which I have met with about *Upminster*, and have constantly found that they were the Production of some or other of the *Ichneumon-Flies*. In my *Physico-Theology*, Book 8. Ch. 6. I have given divers Examples of the Production of the *Vegetable Excrescences*. And as to these artificial and curious *Thecæ* on the Branches of Trees, old Ropes, &c. called *Kermes*, all that I have met with I have always found to be the Cells of a small *Ichneumon-Flie*, composed of some Gums, or glutinous Matter, wrought with incomparable Curiosity, to cover over and secure their Eggs: In which one thing is admirable; and that is their great Sagacity in making their *Cells*, or *Cases*, of the same Colour with the thing on which they are fix'd; by which means they so dodge the Spectator's Eye, that it is not easy to discover the *Kermes*, without a very strict Inspection.

Note concerning the Boiling Springs,
Pag. 151.

THE *Boiling Fountain* at *Peroul* being not occasion'd by a warm, inflammable Vapour, like that of *Wigan* in *Lancashire*, I am inclined to think is of the same Nature with some Boiling Waters I have met with, whose Cause is manifest. One is near *Little Thurrock*, in the Road between *Grays* and *Chadwell*, in *Essex*; where, in a Ditch at the bottom of a pretty high Gravelly-Hill, there are many Springs, which bubble and boil up in large Quantities, like the boiling of Water over a vehement Fire. But I soon perceiv'd that this was no other than the Currents of Water descending plentifully through some subterraneous Passages of the Hill: Which Currents breaking out at the bottom (instead of the Sides of the Hill) caused this Representation of Boiling in divers Parts of the bottom of the Ditch, which carried up with it the small Sticks and Dirt to the top of the Water.

Another *Boiling Water* I have met with, is one called the *Boiling Well*, by the Road side, on the Descent of the Hill above *Sudley-Castle*, near *Winchcomb* in *Glostershire*, where the Water breaks out, and runs into a small Bason, with a gutling bubbling Noise, which gives the Appearance of boiling in the Bason for a short time, and then ceases for a little while, and runs again as before. But this is occasion'd only from a Breach in, or Parting of some Pipes carrying Water from the Conduit, near the top of the Hill, to *Sudley-Castle* at the bottom, and is the same Phænomenon as the pouring Water out of a Bottle with a long Neck.

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